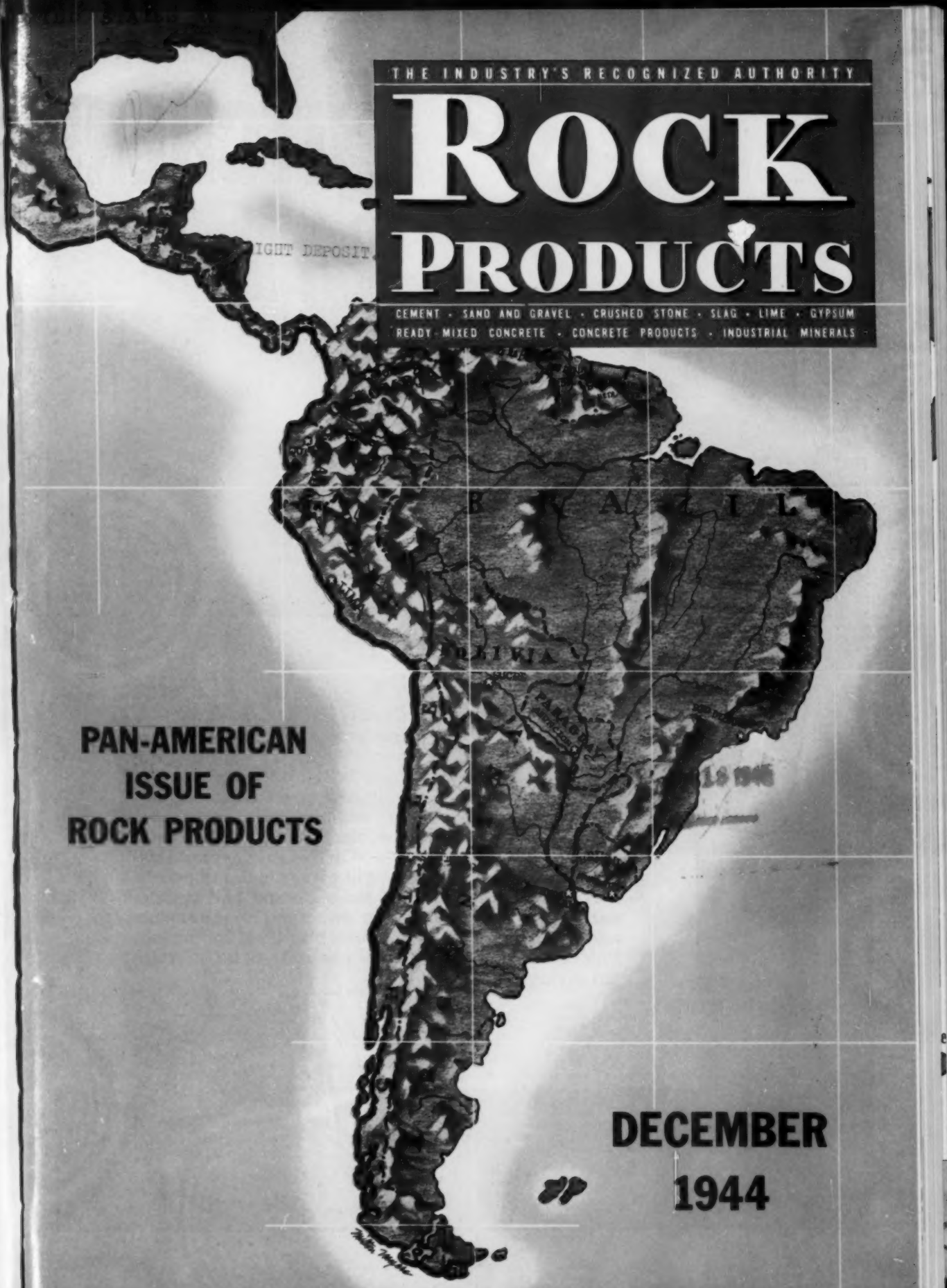

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# ROCK PRODUCTS

CEMENT · SAND AND GRAVEL · CRUSHED STONE · SLAG · LIME · GYPSUM
READY-MIXED CONCRETE · CONCRETE PRODUCTS · INDUSTRIAL MINERALS

## PAN-AMERICAN ISSUE OF ROCK PRODUCTS

## DECEMBER 1944

JAN 17 1945

# PORTER Diesel-Electric SWITCHERS

## Custom Built POWER!

You can order a PORTER Diesel-Electric Switcher with the assurance that it will be engineered, designed and built to fit the requirements of your own particular switching or hauling job. An expert knowledge of switching problems accumulated over a period of 78 years enables PORTER Engineers to design switching power that will give you the utmost in service at the lowest cost for operation and maintenance. Let us analyze your switching requirements and recommend the type of unit best fitted for the job. Such an analysis may reveal possibilities for substantial savings.

PORTER "Better Built" Equipment
Established 1866

**"CUSTOM-BUILT POWER"**

This 20 min. kodachrome sound film showing the building of a PORTER Diesel-Electric Switching Locomotive is available for exhibition at clubs, meetings, etc. Applications for booking may be addressed to the Advertising Dept.

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# Ten-ton tire

## *A typical example of B. F. Goodrich product development*

A TIRE like this weighs only a *third* of a ton but can carry a *load* of *ten* tons, forty tons or more for four tires — nearly as much as a freight car. It is used for off-the-road hauling. It holds as much air as 25 auto tires, takes 20 minutes to inflate, costs $750.

The Pennsylvania Turnpike, finished five years ago, might still be under construction if there were no big tires like this. Dams and airports now finished in 18 months would probably take four and five years to build. But even with all their advantages, costs were too high because these tires, running over big rocks, bruised too easily. Inner cords broke under sharp impact; tires had to be repaired or thrown away. Time and money were lost.

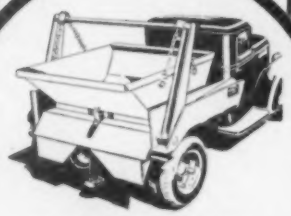
Then B. F. Goodrich men developed a new kind of "bruise-protected" tire. It has four extra layers of cords embedded under the rubber tread, and with a special kind of rubber between them. Under impact the cords distribute the force of the blow and allow it to be absorbed by the rubber.

Contractors tried the new tires. Some of the records were: 17,226 miles against 12,501 for the best of all three ordinary tires used; 15,017 miles compared to 11,304 for the best ordinary tire; 17,599 miles compared to 6,476 for the best ordinary type. There would be even more such records if military needs permitted more contractors to get these new tires.

B. F. Goodrich developments extend to every type of tire — passenger car, truck, airplane, farm, industrial, and the big off-the-road type. Whatever your tire need, if you buy B. F. Goodrich, you get tires backed by this policy of constant improvement.

**B.F. Goodrich**
**Truck & Bus Tires**

Brooks
LOAD
LUGGER
Trade Mark Registered



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Plan now to cut costs and boost profits in hand loading jobs by using Load Luggers mounted on your trucks. The efficient Brooks system saves manpower and speeds up

QUARRY OPERATIONS
LOADING RIPRAP
FEEDING CRUSHERS
STRIPPING OVERBURDEN

For details, see Catalog No. 44 and also ask about the new TruKrane Boom Attachment for the Load Lugger.

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Use 5 to 10 detachable dump buckets with each Load Lugger.

Tilt-type, Skip-type and special Enclosed-type Buckets, available in various capacities.

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# Lorain 82

## DOES AN AVERAGE 4 YEARS' WORK IN 2

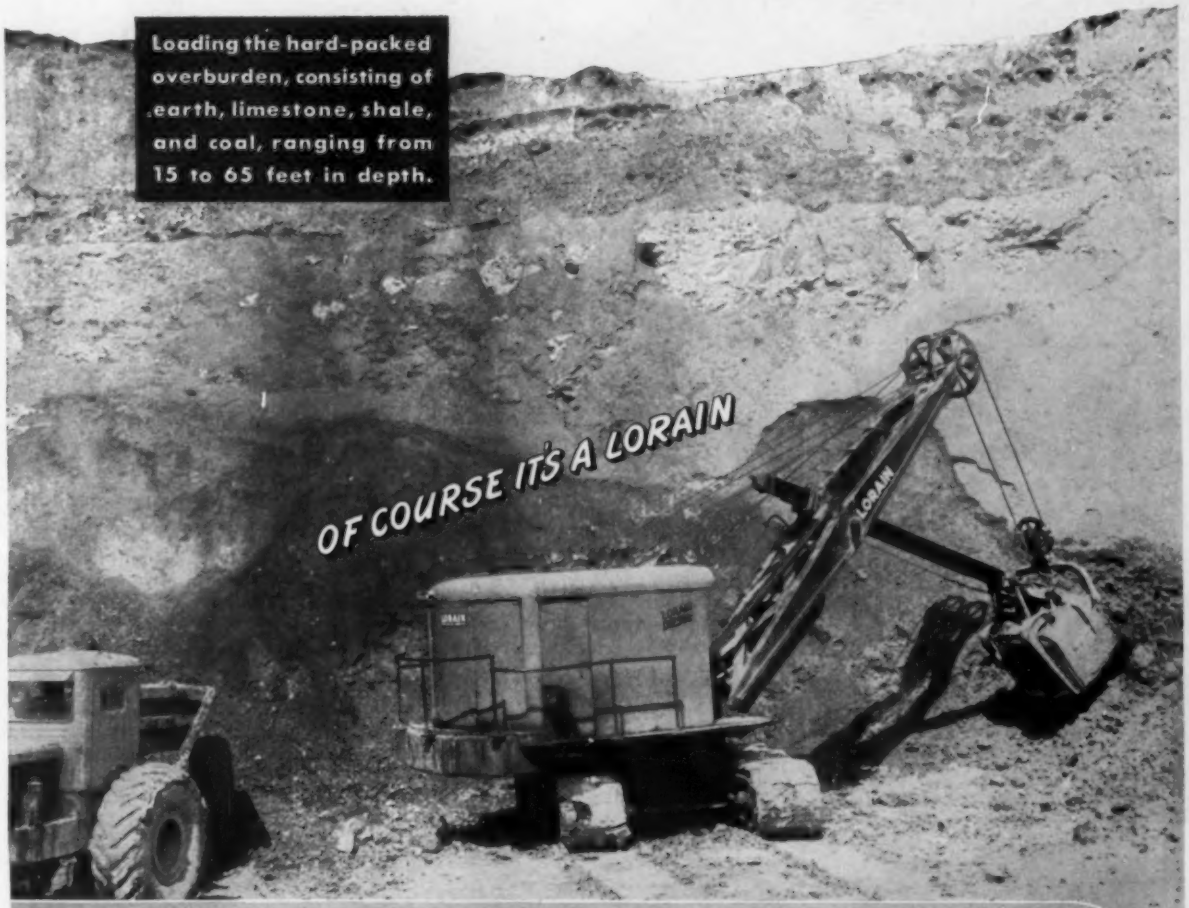
*for Laclede Christy Clay Products*

LATEST records on this Lorain 82, 2 cu. yd. shovel, show that since April of 1942 it has been in almost continuous operation for more than 8,000 hours, giving its owners better than 4 years' average service in 2.

Despite the rough going, this job demanded a shovel with ample payload capacity to keep the fleet of hauling units steadily on the move. As usual, the 2 yd. Lorain 82 came through ace high with plenty of fast 'n furious digging power, delivered through a shock absorbing, hydraulic coupling that means big yardage, low maintenance cost.

When you begin shaping up your plans for post-war replacements of obsolete or wornout equipment, you'll be profit-wise to investigate the greater power, strength, and low cost operating qualities built into all Lorains. Contact your Lorain distributor now He can be a big help to you in planning your peacetime equipment setup.

**THEW SHOVEL COMPANY · LORAIN, OHIO**


Loading the hard-packed overburden, consisting of earth, limestone, shale, and coal, ranging from 15 to 65 feet in depth.
OF COURSE IT'S A LORAIN
LORAIN

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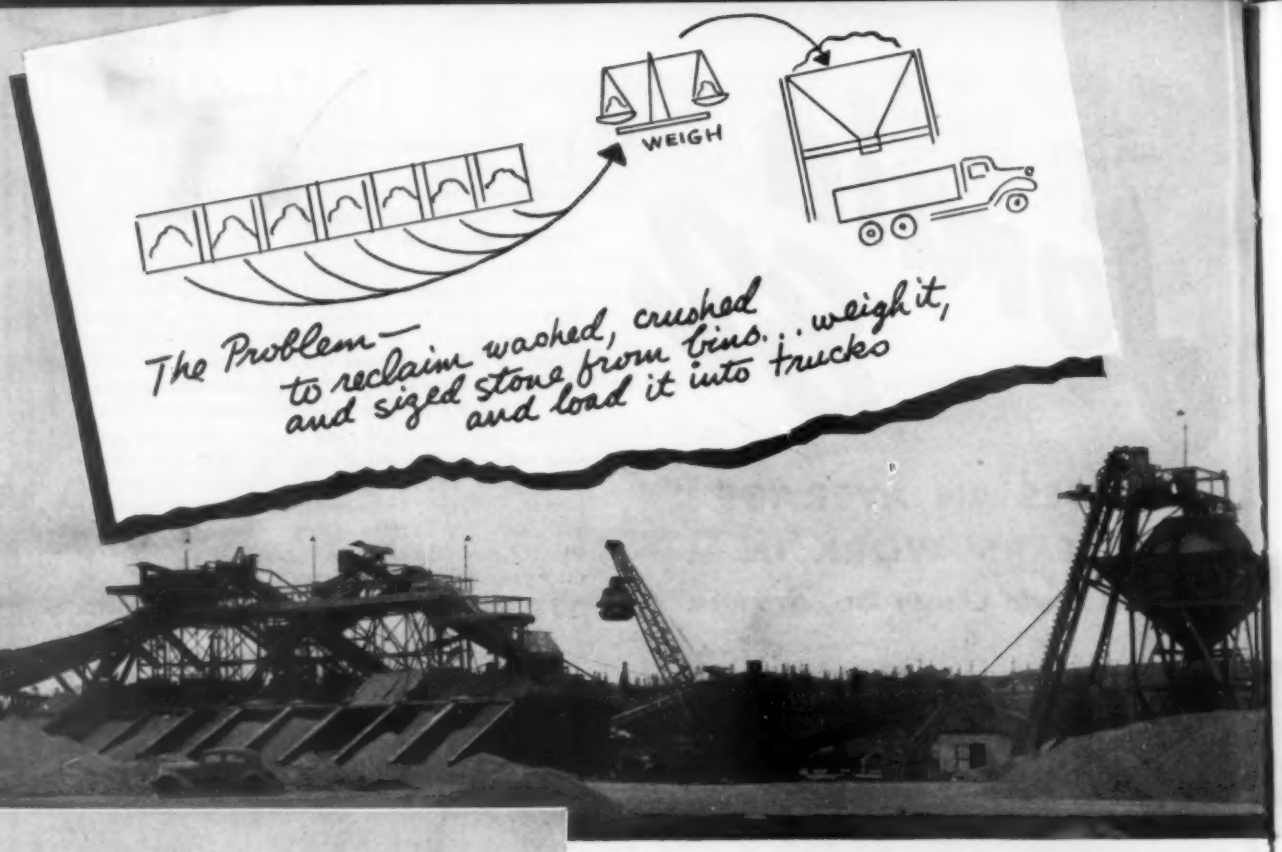
**thew-Lorain SHOVELS**

**CRANES · DRAGLINES · MOTO-CRANES**



## How S-A *Solved the Problem*

Here's further evidence that consulting with Stephens-Adamson engineers produces handling systems that move materials through numerous operations at peak efficiency with a minimum of waste motion. At the plant shown above, the handling of various sizes of washed, crushed and sized aggregate is completely mechanized with S-A conveyors, elevators and several types of S-A screens.

Of particular interest—and actually the key to the efficiency of the entire plant—is the crusher-type bucket elevator shown close-up at the left. This unit elevates any given size of rock reclaimed by belt from the various storage bins and fills the loading bin from which trucks carry weighed loads of material.

For equal efficiency on your handling operations, discuss them with S-A engineers. Get the benefit of careful planning combined with the exact equipment needed. Write us for further information.

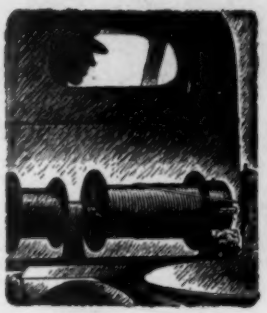
**STEPHEN S-A ADAMSON MFG. CO.**

7 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

*Designers and Manufacturers of All Types of*

**BULK MATERIAL HANDLING EQUIPMENT**

# *Why*
# B-E-T-H-L-E-H-E-M F-O-R-M - S-E-T
# *spells*
# E-C-O-N-O-M-Y



One of the greatest advantages of Form-Set (Bethlehem's preformed rope) is an inherent "bendability" that makes it ideal for use with small sheaves and drums, and where sharp reverse bends are necessary. As the preforming operation greatly reduces internal stresses and strains, Form-Set rope will naturally last longer—and do the job better—where highest resistance to bending fatique is required.

Increased rope life naturally means a saving of overhead. There's a cash value, therefore, in every extra day of Form-Set's life.

And that's not the only saving. The longer your ropes remain in service, the less your machines are "down" for rigging . . . the less productive time you lose.

These are a few of the solid reasons why Form-Set means overall economy in such a wide range of industries—industries that use power shovels, cranes, derricks, overhead air and electric hoists, and many other types of machinery.

Bethlehem makes wire rope in all standard grades and constructions, any of which can be supplied with the Form-Set feature. In addition, we maintain a staff of engineers whose business it is to work closely with you on wire-rope problems.

***When you think WIRE ROPE***
***. . . think BETHLEHEM***

BETHLEHEM STEEL

AMERICA IS *Built with Aggregate!*

# *Another* SWORD *becomes a* PLOWSHARE!

*This Cedarapids mobile plant was on duty in a French quarry five days after D-day.* Signal Corps Photo

*Designed for military service, this type of Cedarapids crushing and screening plant will easily handle your toughest aggregate producing problems.*

Cedarapids

Built by IOWA

## THE IOWA LINE

*of Material Handling Equipment Includes*

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WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

From building military airports and highways that are vital to victory to producing aggregates for peacetime airports, highways, dams, and other construction projects, is the next step for these Cedarapids portable crushing plants.

We're still building them for the Army and Navy but soon all the experience and facilities which produced these plants on schedule can be turned almost entirely to building them for you. They will turn out better products for less money, keeping you in that wonderful competitive position that you have always had with Cedarapids equipment.

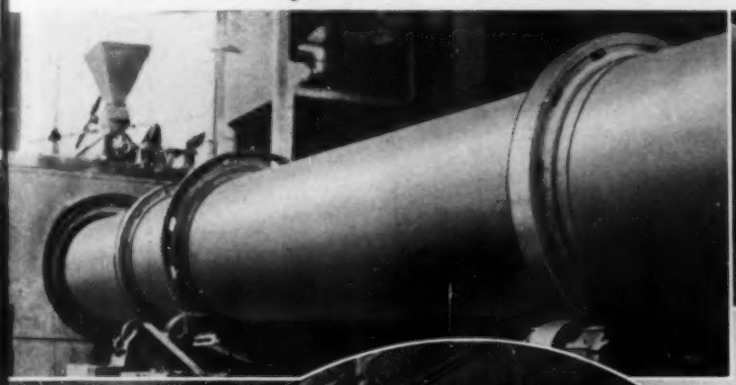
Whether you are figuring on a single unit or a complete plant, you'll be way ahead if you get it from Iowa, headquarters for aggregate producing and crushing equipment, and asphalt plants. See your local Iowa dealer today.

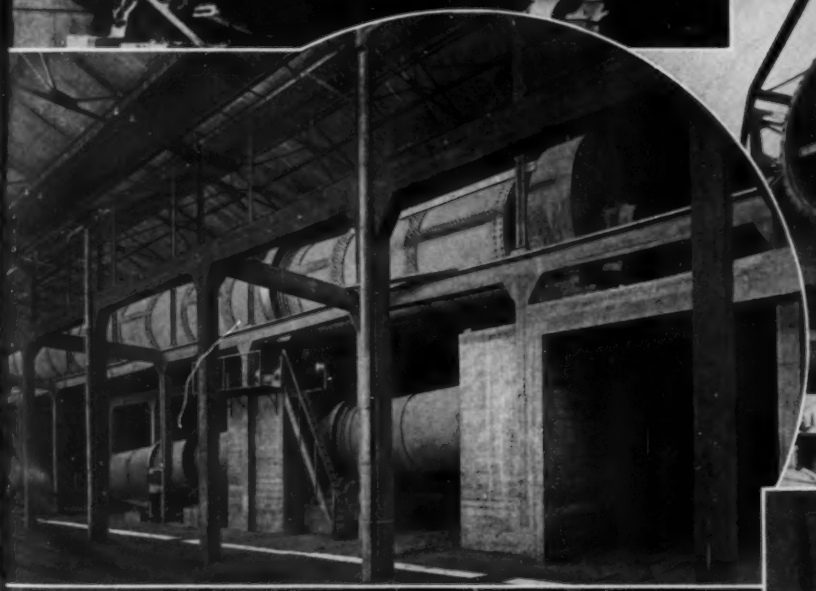
**IOWA MANUFACTURING COMPANY**
**CEDAR RAPIDS, IOWA**

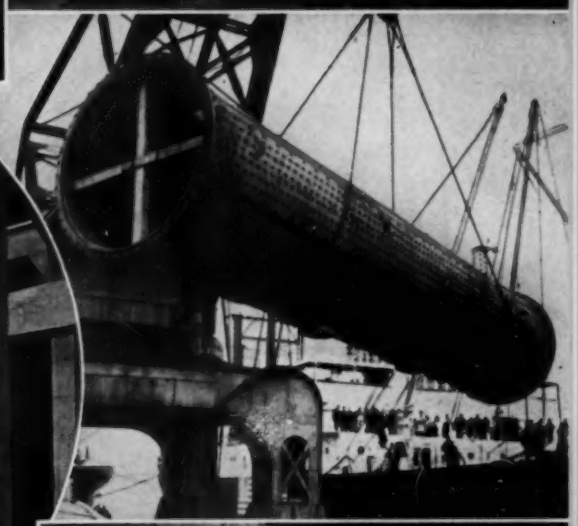
# TRAYLOR IN LATIN AMERICA

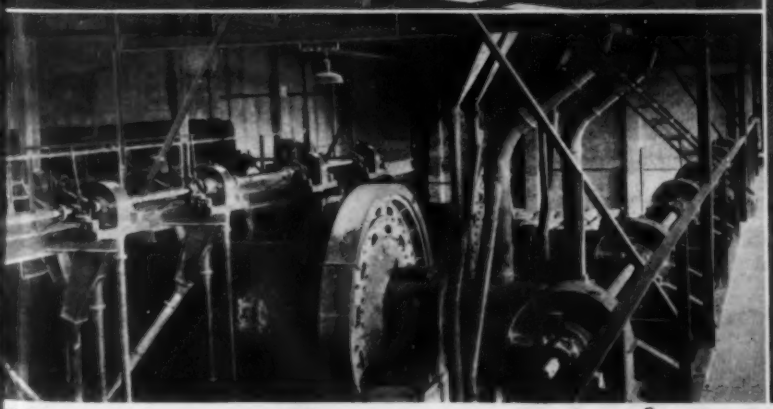
This group of photographs shows a few installations of Traylor cement manufacturing equipment in service in cement plants of good neighbors of the United States, in Latin America. It is a source of gratification to us that Traylor has a prominent part in the production of essential materials in South America.

In addition to kilns, compartment mills and coolers, we have furnished many jaw and gyratory crushers for rock and ore crushing. A recent order was for a 48" primary gyratory crusher and two 5'-0" secondary crushers for iron ore in Brazil.









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*Even the best wire rope—alone—isn't enough. The buyer of rope for the vital war job of today and the cost-conscious job of tomorrow has a right to all that goes with good rope.*

WHAT CAN YOU EXPECT from Roebling? Rope that has known capacity to deliver service. Engineering, in our plant and at your job, to put the rope to work right. Maintenance practices that protect its long life. » » Your postwar jobs and postwar profits will depend in part upon keeping rope-rigged equipment operating at lowest possible cost. You can leave that part to Roebling.

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# BEST FOR ROCK WORK

## because it's armored for the job

**HEAVY-DUTY FEATURES of the Goodyear HARD ROCK LUG TIRE**




1. Massive lug-bar tread
2. Extra-thick undertread
3. Tread-armored sidewalls
4. Super-strong Rayotwist cord carcass

YES, this husky Goodyear Hard Rock Lug tire gives top performance wherever the haul is heavy over tire-cutting, tire-snagging, tire-bruising ground.

That's true because this great tire, proved by years of experience, is specially designed for rock work—is armor-built throughout. It's armored with heavy beads, with extra-heavy undertread, and with massive, wide-based lugs that grip and guard, extending deep down over the sidewalls to *tread-armor* them against cuts and bruises!

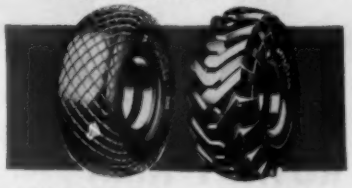
And today this brawny work tire is stronger than ever because it is built with Rayotwist cord—Goodyear's patented rayon cord—the *strongest cord we have ever used in a work tire.*

Goodyear design provides that universal, two-way tread—no rights, no lefts—with the same powerful grip reverse or forward.

It's a *self-cleaning* tread, with straight, wide, V-shaped grooves open at the ends and so pitched that dirt and stones are forced out as the tire turns!

It all adds up to increased job stamina, so it's no wonder that cost-conscious contractors make Goodyear Hard Rock Lugs first choice wherever the going is toughest and roughest.

**THERE'S A GOODYEAR FOR EVERY JOB**



For drawn dirt-movers specify Goodyear All-Weather Earth-Mover

For traction in soft going specify Goodyear Sure-Grip

Rayotwist, Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

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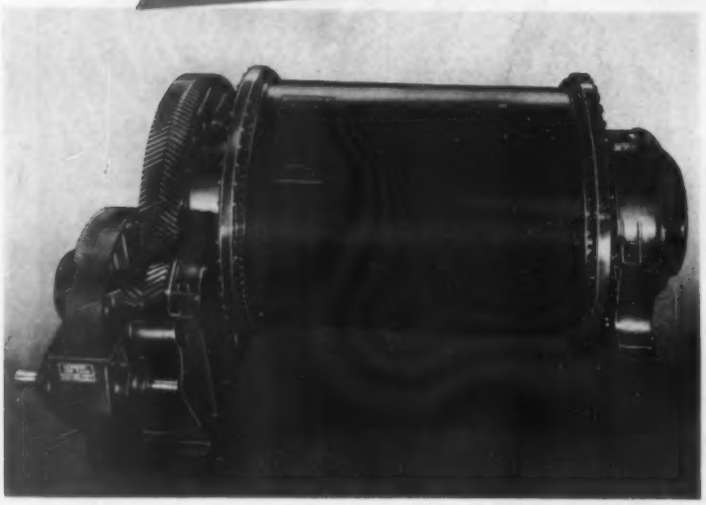
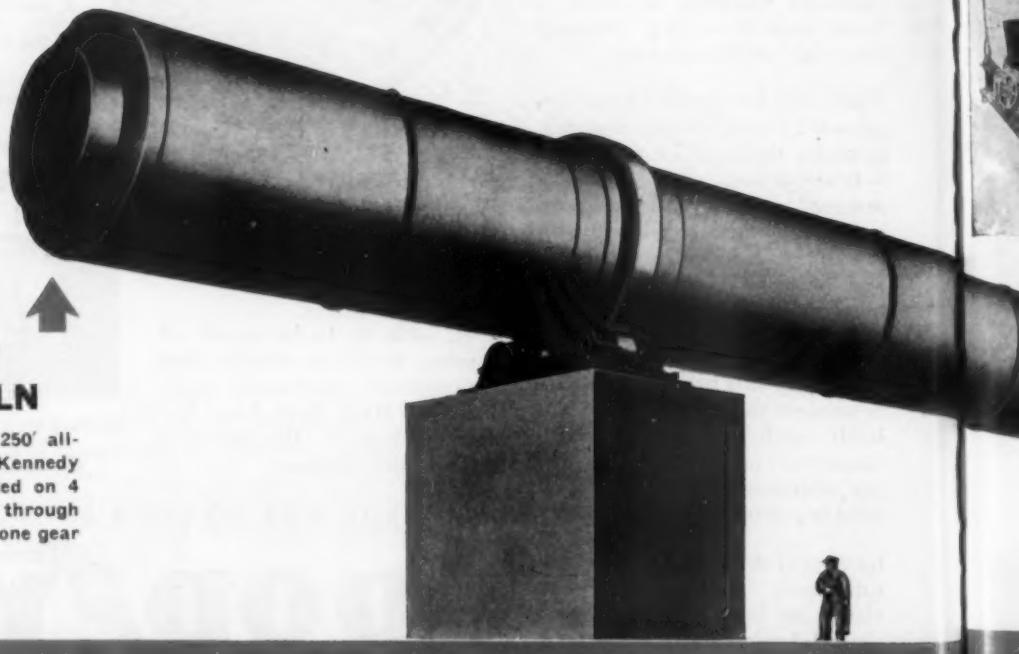
■ We manufacture machinery for the complete cement, lime, crushing or screening plant... machinery in which the materials used are especially selected to suit the work for which intended . . . machinery containing many exclusive features developed as a result of its extensive application.



### KENNEDY
### INTEGRAL GEAR DRIVEN
### TUBE MILL

The new KENNEDY Integral Gear Drive for Tube Mills can be used on Combination Ball Mills, Wet Grinding Tube Mills, Dry Grinding Tube Mills and Air Swept Tube Mills. It is impossible to mis-align these gears because the gear housing supports both the discharge end of the mill and the roller bearings carrying the gears. All bearing seats are machined in a jig at the factory to a tolerance of 3/1000 of an inch.



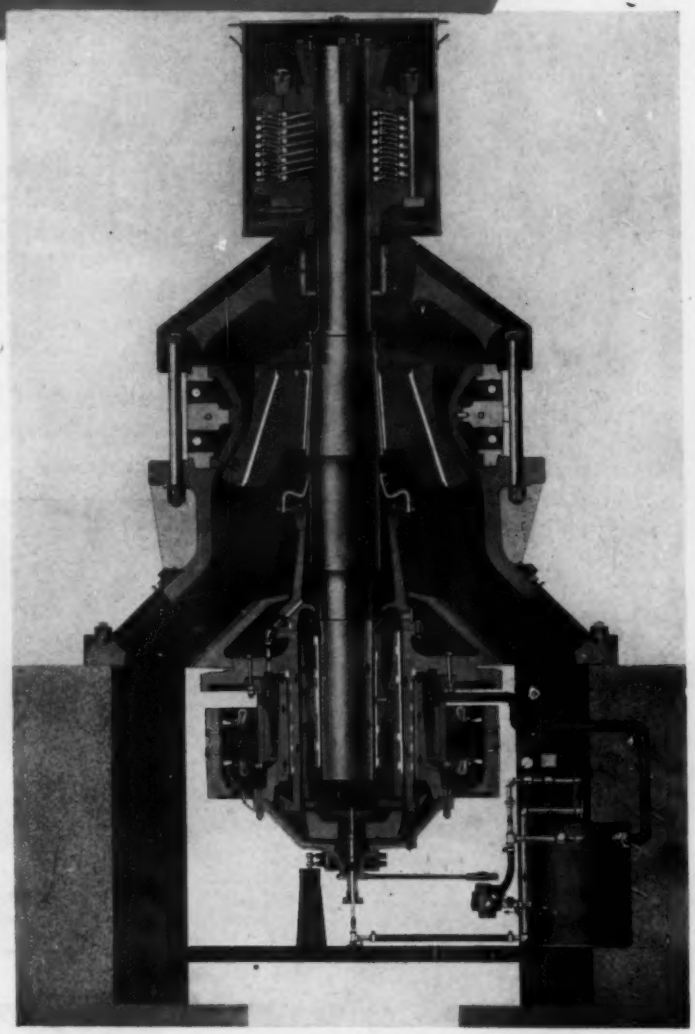
### KENNEDY
### ROTARY KILN

Shown here is a 10′ x 9′ x 250′ all-welded steel construction Kennedy Rotary Kiln. It is mounted on 4 riding rings and is driven through a totally enclosed herringbone gear reducer.

**KENNEDY-VAN SAUN MFG. & ENG. CORPORATION**

# ...for BETTER PERFORMANCE

## FULL POWER FOR ACTUAL CRUSHING



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**BALL BEARING**
**GEARLESS CRUSHER**

With a Synchronous Motor built in its pulley, this machine shows ***80% saving in the cost of maintenance*** and a saving of ***50% in power*** over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom.

The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system. The motor is built specially for this crusher duty and is the finest available.

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**Vibrating Screens**

. . . give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. They maintain the highest efficiency at all times.

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for our catalog and description on these and other types of KENNEDY machinery.

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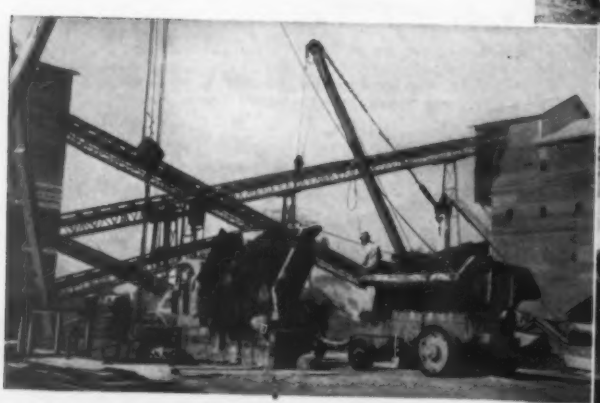
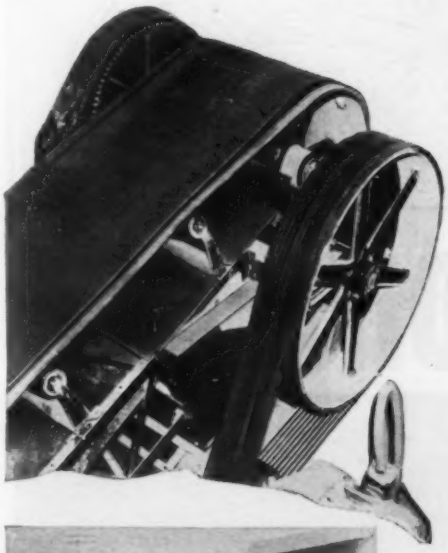
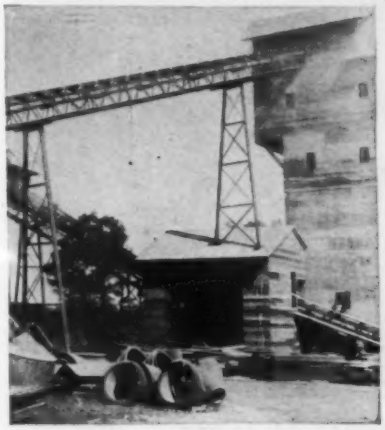


# HOW B G STANDARDIZATION MAKES CONVEYOR INSTALLATION *Quicker and Easier!*





STANDARDIZED Barber-Greene equipment will fit your *custom-built* plant perfectly. It is *pre-engineered,* tested and rated.

This entire B-G Conveyor system, fitting perfectly the new plant for Old Colony Crushed Stone Company at Quincy, Massachusetts, was erected by Old Colony men quickly . . . easily . . . and at low cost.

*Merely bolt the main sections of a B-G Conveyor together and it's ready for work—units arrive on the job conveniently marked and ready for erection.*

B-G standardization saves days of precious time. There's no delay for estimates on cost—our engineers can give you a quotation quickly. No long weeks of waiting for engineering detailing and fabrication—B-G Conveyors, normally, are supplied from stock and shipped shortly after ordered.

**Profit by These B-G Features**

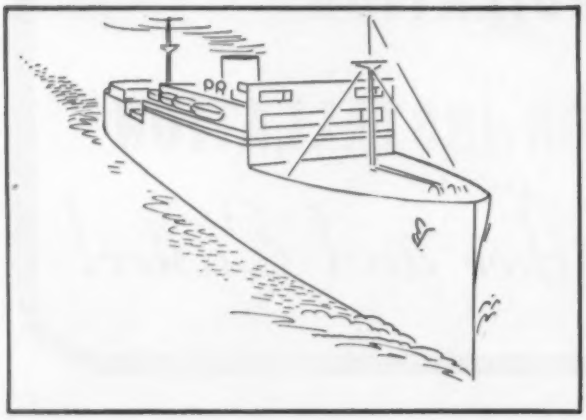
You benefit by B-G standardization in several other ways, too—by low first cost, by the economy of interchangeability, by a flexibility that permits rapid addition, rearrangement or relocation when the system is altered or moved. Factory assembly guarantees correct alignment in erection—reduces belt wear and maintenance.

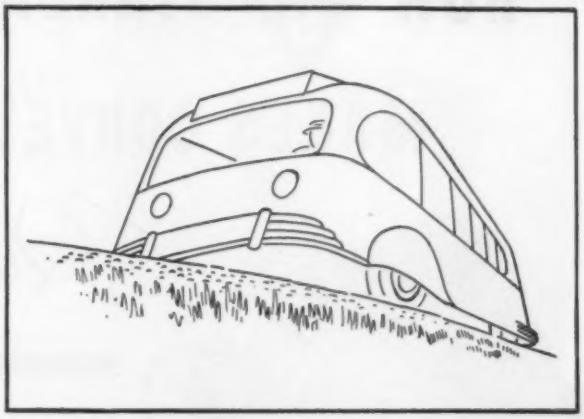
B-G Conveyors are built in a wide range of sizes, forms and capacities to handle a great variety of materials. For complete information on the many advantages of standardization, see your nearest B-G representative. Barber-Greene Company, Aurora, Illinois.

44-29

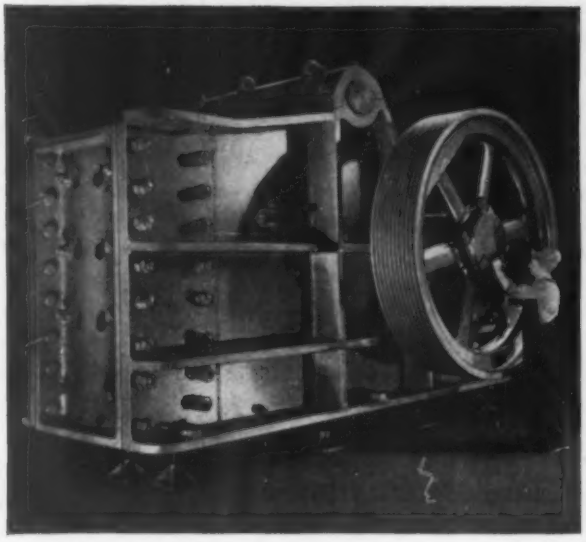
**Barber-Greene** B G *Constant Flow Equipment*

# Carriers are Different





# Crushers are Different



**1 A-C JAW CRUSHERS** are usually applied to primary crushing of tough, blocky materials. In the smaller sizes, they are sometimes used as single-stage machines. Have large receiving openings for blocky feed. Are available with non-choking or straight jaw plates. Five types: "All-Steel", Superior, Type "B" Blake, A-C Fine Reduction, and Dodge. Sizes from 4″ x 6″ to 84″ x 66″. Bulletin B6034.

**2 A-C GYRATORY CRUSHERS** are used for high-capacity primary crushing or to follow primary crushers of jaw or gyratory type. Have greater feed area and considerably greater capacity than jaw crushers. Are low in operating and maintenance cost. Three types: Superior-McCully (Bulletin B6004); Type "R" (Bulletin B6006); and Type "Fine-R". Sizes from 2″ to 60″ receiving openings.


WE WORK FOR VICTORY WE PLAN FOR PEACE

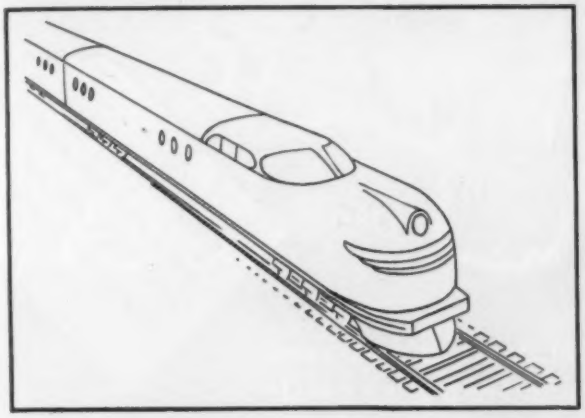
BASIC EQUIPMENT FOR CRUSHING & MINING INDUSTRIES:

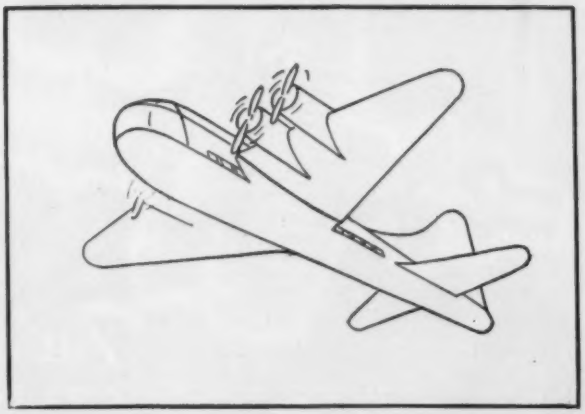
ALLIS

Jaw, Gyratory, Hammer & Roll Crushers, Ball & Rod Mills

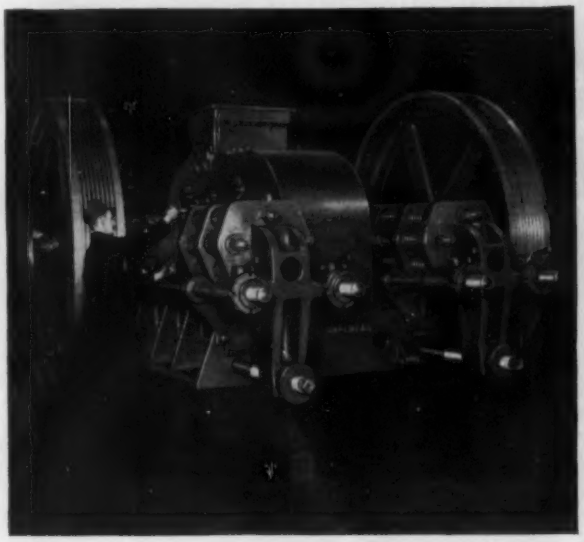
Kilns, Coolers, Roasters, Dryers

## There are 4 Basic Classes of Carriers—each of which is designed to meet a *different* travelling need.





## There are 4 Basic Classes of Crushers—and A-C builds all 4—helps you select the *right* type for each job.



3 **A-C ROLL CRUSHERS** handle a wide range of material including many which, due to unusual characteristics such as stickiness, etc., cannot be reduced by other types of crushers. Single roll crushers are used for primary or secondary crushing — 3 sizes from 24" to 60" diameter. Double roll crushers are used for secondary crushing only — 6 styles, sizes from laboratory to 78" diameter.

4 **A-C PULVERATORS** (Hammer Mills) have broad application in crushing of non-abrasive rock such as agricultural limestone and other materials. In some applications they produce a finished product directly from man-size feed or primary crusher product in one pass. Built in 6 sizes. Bulletin B6265. ALLIS-CHALMERS, MILWAUKEE. A 1788

♪ *Tune in the Boston Symphony, Blue Network, every Sat. Eve.*

# CHALMERS

Vibrating & Revolving Screens, Feeders, Conveyors, Hoists

Washers, Scrubbers, Blade Mills, Centrifugal Pumps

Tractors, Gasoline Power Units, etc.

Motors, Texrope Drives, Power Equipment

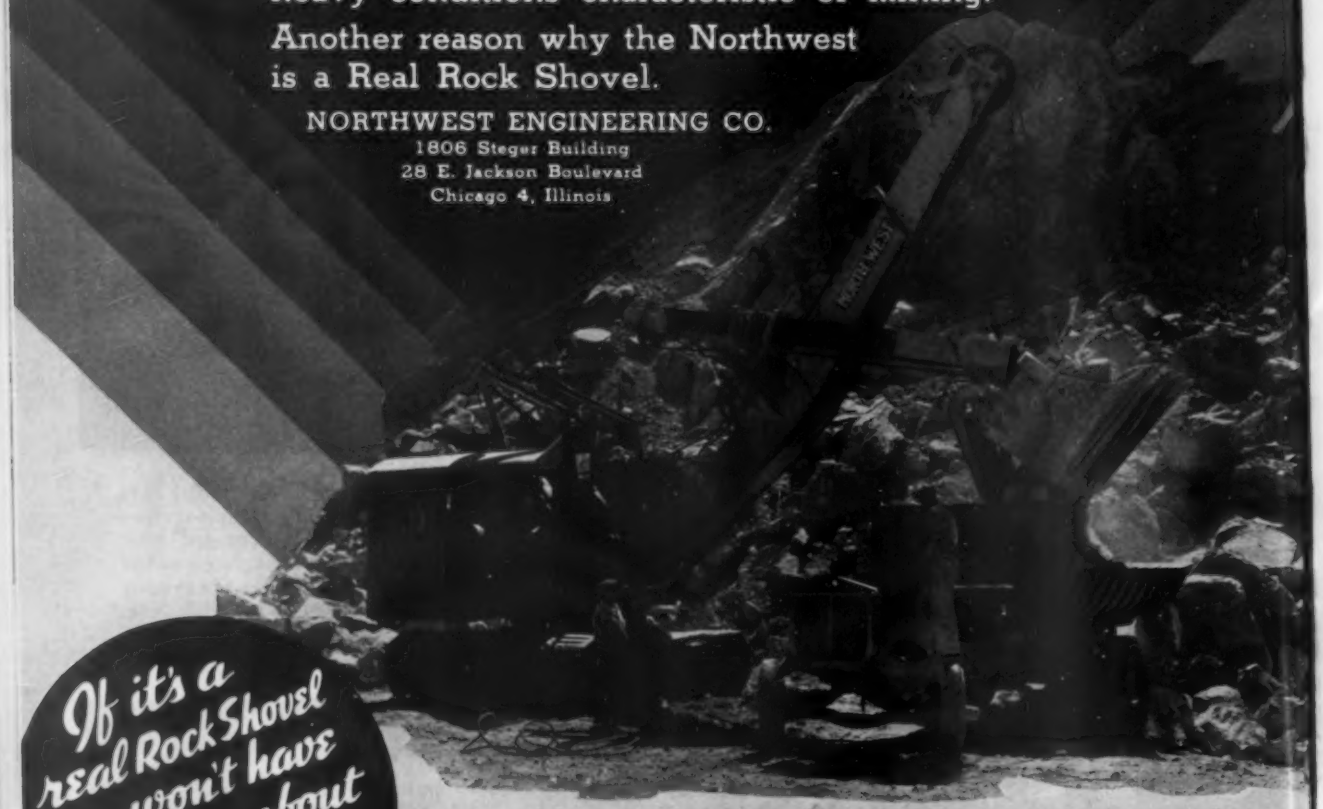
# SWING CLUTCHES

Quick shovel information for the man that OK's the purchase of shovels.

THE most used and abused piece assembly on any mining shovel! Northwest Swing Clutches are uniform pressure clutches. No band type clutch *can be a uniform pressure clutch.* Northwest uniform pressure clutches mean smoother engagement, cooler running, less frequent adjustment and longer life under the heavy conditions characteristic of mining.

Another reason why the Northwest is a Real Rock Shovel.

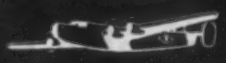
NORTHWEST ENGINEERING CO.
1806 Steger Building
28 E. Jackson Boulevard
Chicago 4, Illinois



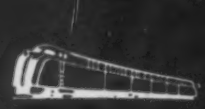
*If it's a real Rock Shovel you won't have to worry about output in dirt*

# NORTHWEST

*Convertible for any Mining, Material Handling or Excavation Problem*



# 5



## *big advantages of*

# PORUS-KROME*

**1** PORUS-KROME applied to the cylinder walls of gasoline and Diesel engines multiplies the life of the cylinders from 4 to 20 times.

**2** PORUS-KROME on the cylinder walls multiplies the life of the ordinary piston rings from 3 to 5 times.

**3** PORUS-KROME, with its thousands of tiny pores and channels which hold lubricating oil and feed it back as needed, improves lubrication and holds lubricating oil consumption at a constant low level.

**4** PORUS-KROME and piston rings wear so slowly that high power development is maintained for many more hours . . . many more miles . . . than with ordinary cylinders.

**5** PORUS-KROME means greater engine reliability because it reduces scoring and scuffing and the risk of piston seizure and because it cuts down the number of overhauls caused by cylinder and ring wear.

***All of these advantages add up to a substantial saving in engine operating costs.***

VAN DER HORST

U. S. PATENTS 2,048,578 AND 2,314,604

## PORUS - KROME

*Good for the Life of your Engines*

* PORUS-KROME is pure, hard chromium which is applied to cylinder bores by the patented Van der Horst process. It has tiny pores and channels in its surface which serve as reservoirs for lubricating oil, feeding it back as needed. It reduces corrosion and wear and multiplies cylinder life 4 to 20 times.

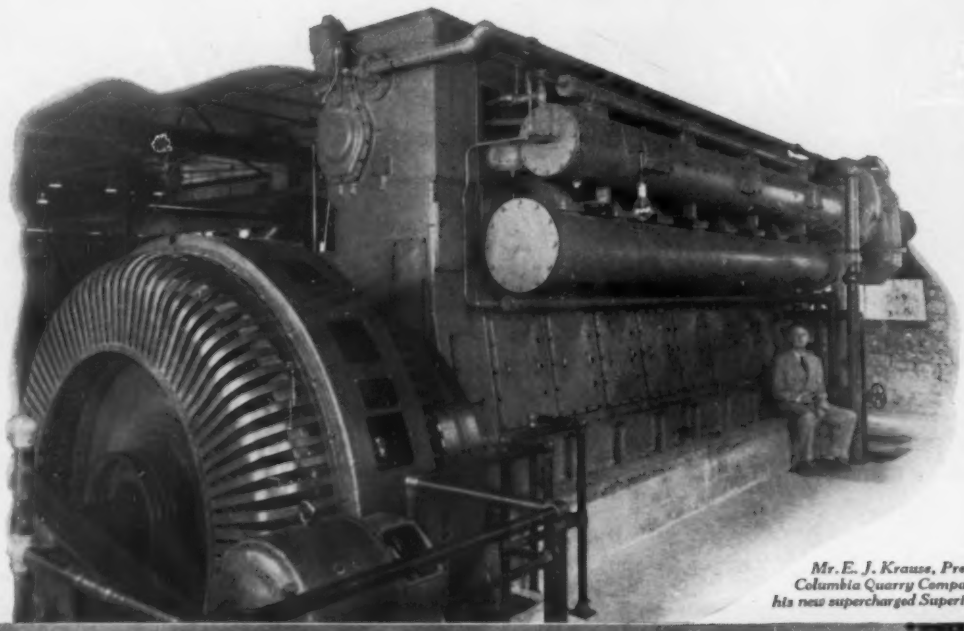
**VAN DER HORST CORPORATION OF AMERICA** OLEAN · NEW YORK CLEVELAND 11 · OHIO

AN AFFILIATE OF DRESSER INDUSTRIES

## Columbia Quarry Co. Installs

# NEW SUPERCHARGED SUPERIOR DIESEL

## to increase nation's output of agricultural limestone



*Mr. E. J. Krause, President of Columbia Quarry Company, with his new supercharged Superior Diesel*

IN response to the War Food Administration's plea for additional tonnage of agricultural limestone, Columbia Quarry Company of St. Louis have added another Superior Diesel to their six Superiors already in service. This new supercharged 14½ x 20 Superior is rated at 1000 HP at 300 RPM.

Columbia Quarry's all-Diesel power plant now totals over 4000 HP—the largest installed Diesel horsepower in the rock crushing industry in America, and its production of 4000 tons of agricultural limestone every 24 hours means bigger crops and more food for wartime needs.

**SUPERIOR ENGINES**
**Division of The National Supply Co.**
**Executive Offices: Pittsburgh, Pa.**

*General Sales Office:* Springfield, Ohio

*Sales Offices:* Ames, Iowa; Boston, Mass.; Chicago, Ill.; Detroit, Mich.; Fort Worth, Texas; Houston, Texas; Huntington, W. Va.; Jacksonville, Fla.; Los Angeles, Calif.; Philadelphia, Pa.; New York, N. Y.; St. Louis, Mo.; Seattle, Wash.; Tulsa, Okla.; Washington, D. C.

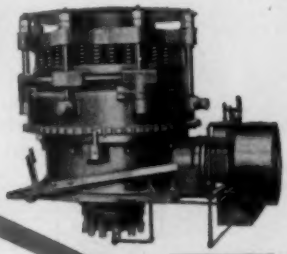
*Canadian Distributors:* The General Supply Co., Ltd., Ottawa, Montreal, Toronto

*Superior* DIESELS • STATIONARY, 31 to 1325 H. P.
MARINE, 28 to 1325 H. P. • GENERATOR SETS, 12½ to 905 kw.

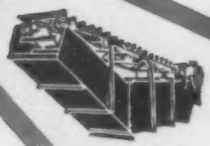
# TELSMITH GRAVEL PLANT and QUARRY *Equipment*

From crushers to bin gates—Telsmith makes every type of rock, ore and gravel handling machinery. Each Telsmith unit has every modern feature of design—is entirely dependable as to product quality, quantity and sizing. You get greater production with no trouble, less power and lowest upkeep. Whether you modernize, expand or build a new plant, *buy Telsmith Equipment*. Illustrated Book No. E-11 *free*.

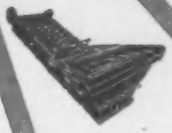
SAND TANKS



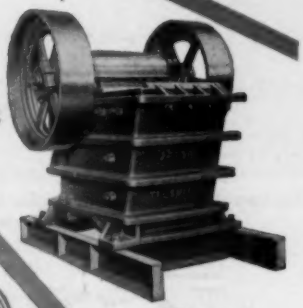
GYRASPHERE CRUSHERS



SAND DRAGS

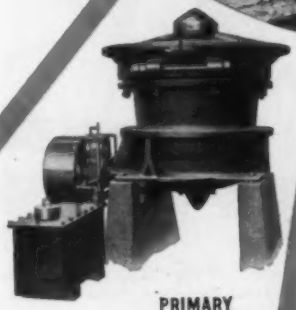


SAND CLASSIFIERS

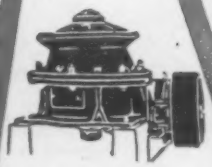


JAW CRUSHERS

BELT AND BUCKET ELEVATORS

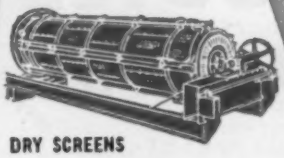


PRIMARY BREAKERS

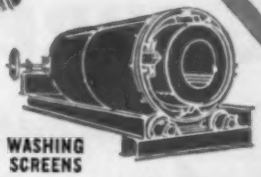


REDUCTION CRUSHERS

HEAVY DUTY FEEDERS

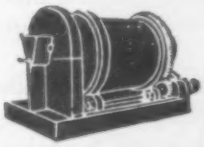


DRY SCREENS

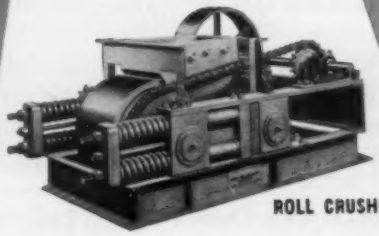


WASHING SCREENS

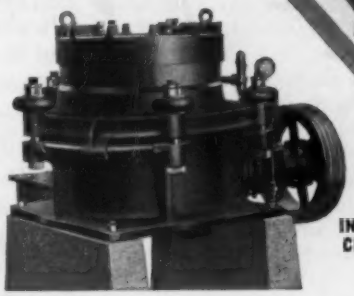
PULSATORS



SUPER SCRUBBERS



ROLL CRUSHERS



INTERCONE CRUSHERS

E-4

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*Gardner-Denver UM-99 Wagon Drill. Fast drilling assured by ability to handle full six-foot steel changes.*

*Gardner-Denver WD4P Wagon Drill especially designed for deep hole drilling.*

# SURE-FOOTED . . .

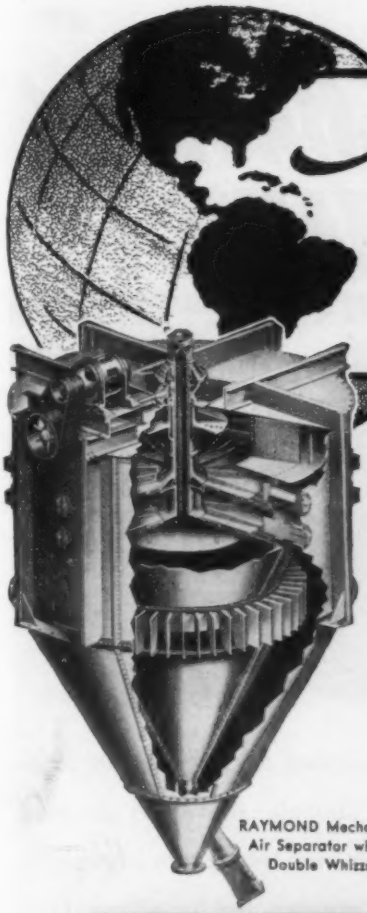
## *Gardner-Denver Wagon Drills*

They're at home on the roughest ground, these "sure-footed" Gardner-Denver Wagon Drills. Their extreme maneuverability makes accurate spotting of holes simple.

For deep hole drilling, even in the toughest rock, these highly mobile wagon drills are noted for their speed . . . for their exceptional hole-cleaning ability. They are easily adjustable for any desired drilling position, toe holes, down holes, or for broaching. Conveniently located throttle valves assure ease of control.

Air consumption of Gardner-Denver Wagon Drills is remarkably low, and sturdy construction keeps maintenance costs to a minimum. For complete information and specifications, write Gardner-Denver Company, Quincy, Ill.

**GARDNER-DENVER** *Since 1859*



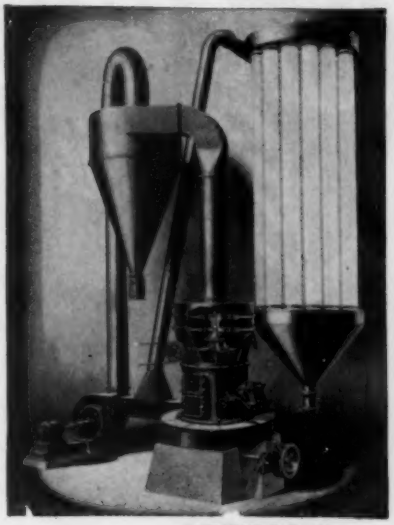
RAYMOND Mechanical Air Separator with Double Whizzer

# All AMERICA . . .

## DEPENDS ON RAYMOND EQUIPMENT

*for . . .*

## PRODUCTION OF CEMENT GYPSUM LIME PHOSPHATE ROCK and other Non-Metallic Minerals



RAYMOND Roller Mill with Double Whizzer Separator

RAYMOND Automatic Pulverizer with Whizzer Separator for Grinding and Classifying Lime

SINCE 1887

With the rock products industry extending its activities over both continents, Raymond pulverizing and separating machinery offers time-proved methods of producing uniform finished materials to meet any range of specifications required by varying local demands.

Raymond Roller Mills . . . Low-Side and High-Side types for fine or superfine grinding . . . are available in capacities for any requirements. With air drying systems, they can handle moisture-laden materials like raw gypsum rock, clays or limestone, *drying and pulverizing in a single operation.*

Raymond Mechanical Air Separators with single or double whizzer give close product control in classifying cement, lime and similar materials. They insure greatly increased output, from 25% up to 75%, when used in closed circuit operations with grinding mills.

Raymond Automatic Pulverizers are standard equipment for lime production, both agricultural lime and superfine chemical hydrate, to any degree of fineness up to 99.5% passing 400-mesh.

*Catalogs giving complete data will be forwarded on request.*

**RAYMOND**
**PULVERIZER DIVISION**

COMBUSTION ENGINEERING COMPANY, INC.

Sales Offices in Principal Cities
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# Do BOTH Jobs Efficiently!

## SHORT HAULS ✓
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● With modern loading units and Bottom-Dump or Rear-Dump EUCLIDS you can move more dirt on both long and short hauls at lowest cost per yard. Using efficient digging and loading tools and Euclid equipment to haul economically is the surest way to keep costs down and profits up.

Euclids are designed for faster, easy loading under large shovels, elevating graders, draglines, transfer bins, etc. From bumper to bumper they are constructed for efficient off-the-highway service, and have proved their versatility and lower operating cost on hundreds of the toughest jobs.

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**CLEVELAND 17, OHIO**

**EUCLID** SELF-POWERED HAULING EQUIPMENT
For EARTH ROCK COAL ORE

# IT HAD TO BE DONE ...AND WE DID IT!

Early in 1940 the Navy Department began to visualize a possible shortage of steel plate. Reinforced concrete tanks for fuel storage were suggested if they could be so lined as to prevent seepage of the gasoline.

BWH engineers solved the problem by lining the tanks with a thin sheet of synthetic rubber, covering walls, floors and columns like wall paper. This not only prevented seepage but protected the gasoline from a drop in octane rating.

Another example of BWH ingenuity and resourcefulness in applying rubber to a difficult problem.

BOSTON WOVEN HOSE & RUBBER COMPANY

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# One of the Most Modern Plants in the World Producing Wire Rope for All Types of Industries

The uses of wire rope are many and varied. There must be different kinds and sizes, and so designed as to properly perform different functions on many kinds of machines and under many different operating conditions.

Obviously, wire rope making is a job for specialists. In the great factory of Union Wire Rope Corporation it is in the hands of specialists—from the determination of the correct steel formula for each type of wire rope to meet every field condition. These specialists devote their whole time, creative ability and skill to the one job of making wire rope. At this job they do not propose to be surpassed.

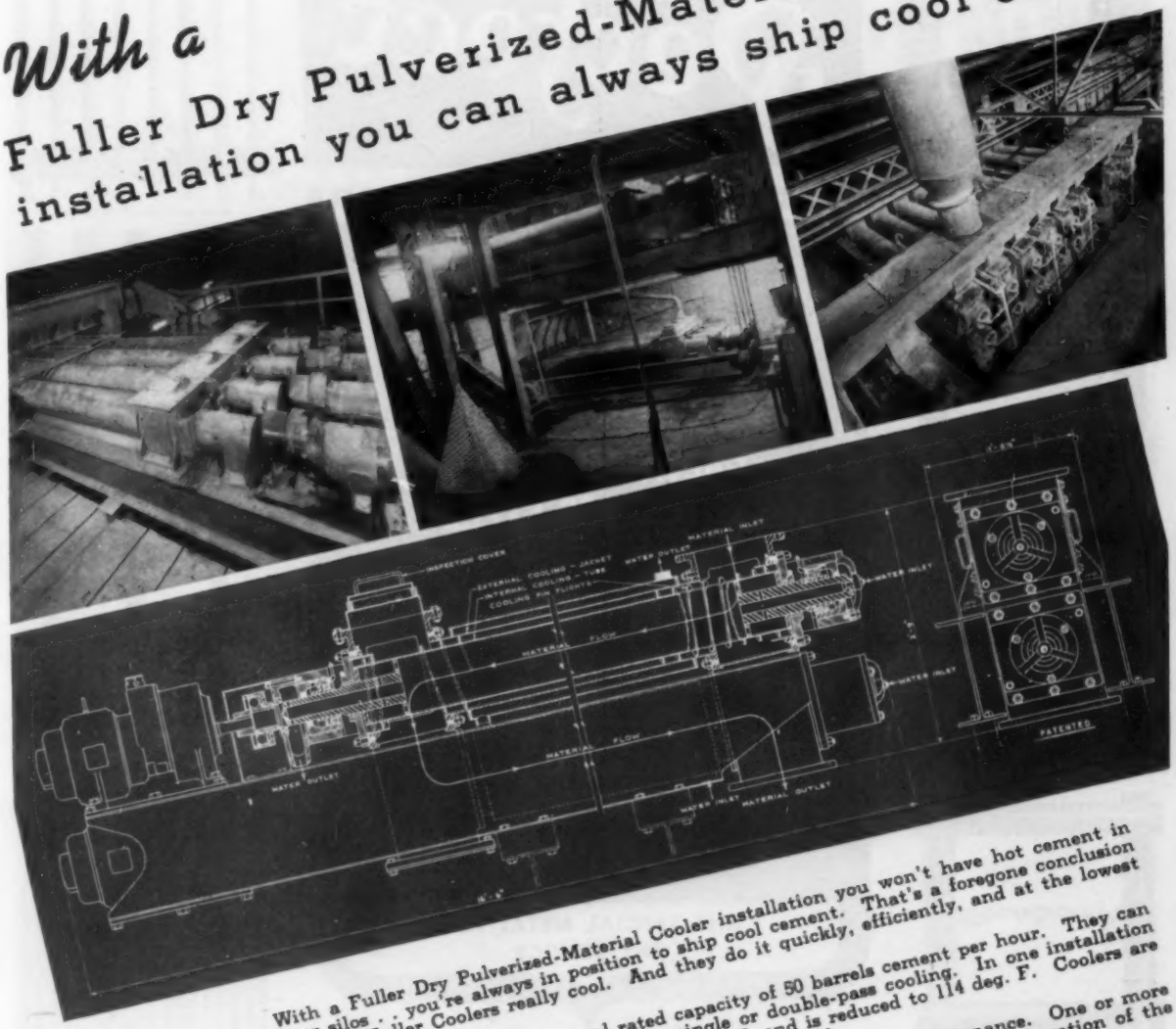
**UNION WIRE ROPE CORPORATION**

2156 Manchester Ave., Kansas City 3, Missouri, U. S. A.

union Wire Rope

1-7

# With a Fuller Dry Pulverized-Material Cooler installation you can always ship cool cement




With a Fuller Dry Pulverized-Material Cooler installation you won't have hot cement in your silos . . . you're always in position to ship cool cement. That's a foregone conclusion because, Fuller Coolers really cool. And they do it quickly, efficiently, and at the lowest possible cost.

Each cooler unit has a normal rated capacity of 50 barrels cement per hour. They can be installed in parallel or in series, for single or double-pass cooling. In one installation cement is delivered to the coolers at 260 deg. F. and is reduced to 114 deg. F. Coolers are handling cement having a surface area as high as 2700.

Simple in design, efficient, low in power consumption and maintenance. One or more units may be shut down for inspection or repairs without affecting the operation of the other units. The internal mechanism is readily accessible.

Make your plans now and be ready to install Fuller Coolers at the first opportunity.

## FULLER COMPANY, CATASAUQUA, PA.

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FULLER COMPANY

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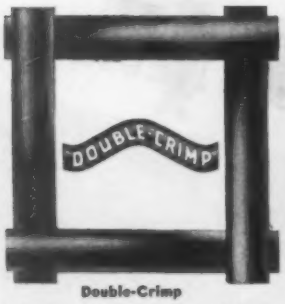
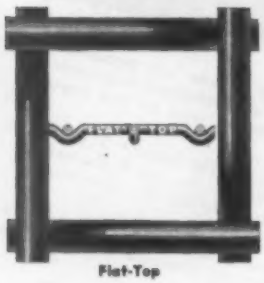
PMC-6




Double-Crimp

Arch-Crimp

Intermediate-Crimp




Flat-Top

# "The Perfect"

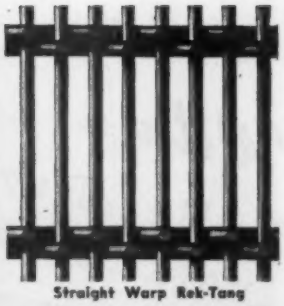
## Wire Cloths and Screens

OF

**SUPER-LOY STEEL**

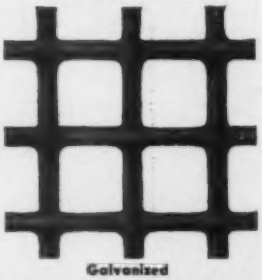
GALVANIZED STEEL
STAINLESS STEEL
NICKEL-CHROME STEEL
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

**ANY SPECIAL METAL FOR ANY SERVICE**

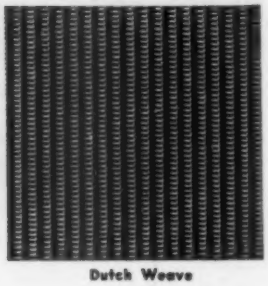


Straight Warp Rek-Tang

Calendered Rek-Tang



Galvanized



Dutch Weave

### "Perfect" WEAVES

**ARCH-CRIMP**
Coiled
**DOUBLE-CRIMP**
Double-Fill
**DUTCH**
**FLAT-TOP**
**INTERMEDIATE-CRIMP**
**REK-TANG**
Selvage-Edge
**STRAIGHT-WARP**
Stranded
**STA-TRU**
Triple-Warp
Twilled
Twisted-Fill
Twisted-Warp

### "Perfect" PROCESSING

Arc-Welding
Bending
Binding
Brazing
**CALENDERING**
Coiling
Crimping
Cutting
Dipping
Dishing
Finishing
Flanging
Flattening
Forming
Framing
**GALVANIZING**
Jointing
Knuckling
Painting
Rolling
Selvaging
Shaping
Shearing
Slitting
Soldering
Spot-Welding
Squaring
Stitching
Tack Welding
Trimming

### "Perfect" PRODUCTS

Baskets
Circles
Coils
Cones
Cylinders
Discs
Forms
Leaves
Lengths
Panels
Pieces
Ribbons
Rings
Rolls
Sections
Segments
Strips
Templates

*Illustrations show items listed in capital letters. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.*

Sta-Tru

**THE LUDLOW-SAYLOR WIRE CO.**

**ST. LOUIS 10, MISSOURI**

Nitro Starch Base
HIGH EXPLOSIVE EFFICIENCY
IN MINING · QUARRYING · LOGGING · CONSTRUCTION
PLUS THREE ADVANTAGES FOR YOU!
● America's fists are swinging with ever-increasing power. We are proud that Trojan Explosives are helping our fighters shorten the road to Victory. But, we shall be grateful, indeed, when the power of Trojan again can be turned fully to its intended purposes of building and development.
BUY BONDS!
● WILL NOT PRODUCE HEADACHES from handling . . . reduces discomfort from breathing muck pile fumes. Better working conditions for you and your men!
● WILL NOT FREEZE or leak at Arctic or Tropic temperatures. Maintained high efficiency . . . anywhere anytime!
● WITHSTANDS IMPACT in high-powered Rifle Bullet Test. Greater safety for workers!
EXPLOSIVES 1905 TROJAN 1944 CHEMICALS
POWDER COMPANY
ONE OF AMERICA'S OLDEST HIGH EXPLOSIVES MANUFACTURERS
PLANTS: SEIFLE, PA. • ROBERT, CAL. • MAGAZINES STRATEGICALLY LOCATED THROUGHOUT THE NATION

OFFICES: ALLENTOWN, PA. • SAN FRANCISCO, CAL. • LOS ANGELES, CAL. • PORTLAND, ORE. • NEW YORK, N.Y.

*Machines like this for applying Rip-Cord closures to cotton valve cement bags enable one operator to sew and bundle over 1000 bags an hour. The conveyor, synchronized with the sewing speed, carries bags through the machine and automatically stacks and counts them.*

# Bemis Rip-Cord Closure makes cotton cement bags go further

EXPERIENCE of cement manufacturers shows they get greater mileage from cotton bags after adopting the Bemis Rip-Cord Closure. In many cases the number of trips per bag has been increased from 8 to 12...an increase of 50% in the life of the bag.

Rip-Cord-closed bags deliver this extra service to cement manufacturers because neither closing nor opening damages the fabric.

More trips per bag is only one of the economies of using the Rip-Cord Closure. The original cost of bags is less than when made for wire tie closing because bags can be made smaller and without hems. Efficiency in filling is stepped up. There are added savings in handling...in storage and shipping space. Mail the coupon today for complete details on the efficient, economical Bemis Rip-Cord Closure.

**BEMIS BAGS**

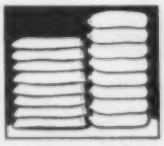
**BEMIS BRO. BAG CO.**

OFFICES: Baltimore · Boston · Brooklyn · Buffalo · Charlotte · Chicago · Denver · Detroit · East Pepperell · Houston · Indianapolis · Kansas City · Los Angeles · Louisville · Memphis · Minneapolis · Mobile · New Orleans · New York City · Norfolk · Oklahoma City · Omaha · Peoria · St. Helens, Ore. · St. Louis · Salina · Salt Lake City · San Francisco · Seattle · Wichita · Wilmington, Calif.

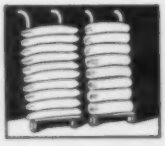
BETTER BAGS FOR 85 YEARS

***Saves Money!*** With Rip-Cord Closure bags can be made smaller and without hems and their life is increased, thus reducing costs.

***Saves Bags!*** The Rip-Cord Closure is so easy to open—no tools are required and workmen never need damage bags to remove contents.



***Saves Space!*** Bags closed with Rip-Cord are uniform in size and shape, saving shipping and storage space. Both stacks contain same amount.



***Saves Time!*** More Rip-Cord closed bags can be put on a truck. This means fewer trips for workmen when loading, unloading, storing.

***Free Sample***
**AND LITERATURE**

Investigate the economy, added efficiency and sales advantages of the Bemis Rip-Cord Closure. A sample of the Rip-Cord Closure and descriptive folder will be sent promptly upon request.

**MAIL THIS COUPON!**

BEMIS BRO. BAG CO.
408-M Pine St., St. Louis 2, Mo.

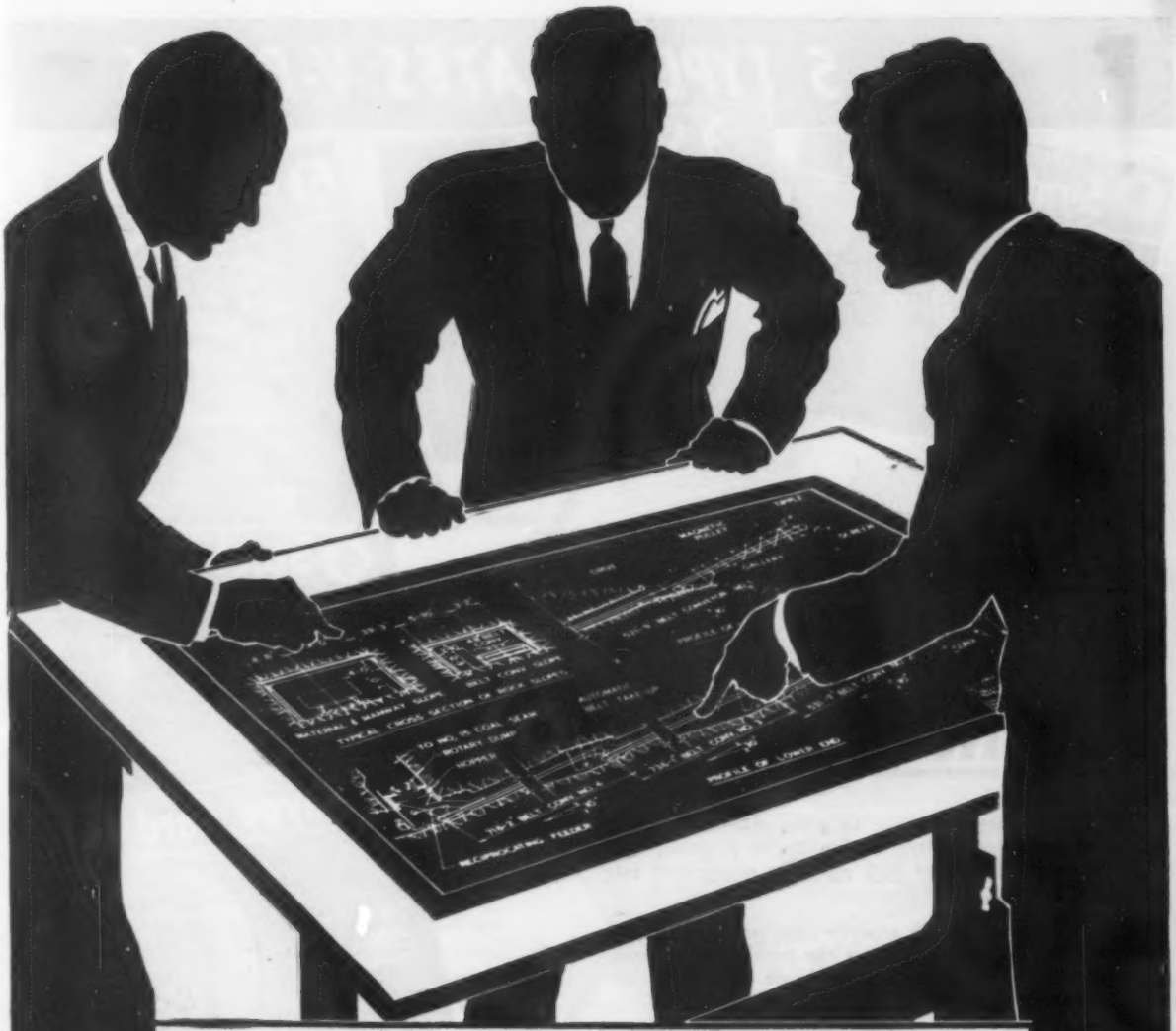
Please send literature describing the Bemis Rip-Cord Closure and a sample.

*Name*_____

*Company*_____

*Street*_____

*City*_____ *State*_____



# 3 ENGINEERING TECHNIQUES

## ARE ESSENTIAL

The skills of three separate engineering staffs determine the design of your U. S. Rubber Conveyor Belts.

For every conveyor belt must be individually engineered, if it is to prove satisfactory in all respects. The particular conditions under which it will operate must be known and considered.

The design and construction of a U. S. Rubber Conveyor Belt, therefore, is influenced from the time a mine or quarry is planned.

Long before we produce a belt for you, our engineers have held two vitally necessary consultations: one with your engineers *at the scene of service;* another with the makers of the mechanical conveyor equipment installed.

Only through such coordinated effort can a conveyor belt be properly designed and built. All three groups must make their technical contribution in developing belts that can be relied on for long, economical service.

***SERVING THROUGH SCIENCE WITH*** ***ENGINEERED RUBBER CONVEYOR BELTS***

# UNITED STATES RUBBER COMPANY

**1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20. N. Y. •** *In Canada:* **DOMINION RUBBER COMPANY, LTD.**

# Here are 5 TYPES of GATES V-BELTS

## ONE of these five types Will Fit Any Need You Have!

Whenever a drive in your plant is wearing out belts faster than it should—or is giving any other trouble—just *pick up your phone* and call the Gates Rubber Engineer.

He can quickly analyze your problem and, in most cases, he can correct the trouble very easily without needing to specify the use of any special-structure belts.

There *are* service conditions, however, under which a V-Belt of special construction can most profitably be used—and your Gates Rubber Engineer can then supply a Gates V-Belt that is precisely engineered to meet the unusual conditions.

**The Gates V-Belt of special synthetic rubber is a notable example. As a result of specialized research, Gates developed this synthetic rubber V-Belt and began supplying it in large quantities to industry more than six years ago. Under severe conditions of heat and oil, this Gates special synthetic V-Belt actually outwears any natural rubber belt by as much as 230%.**

In your particular application, V-Belts with tension members composed of flexible steel cables —or of rayon cords—may prove to be the most efficient and economical. Again, Gates Static-Safety V-Belts may best fit yur special need.

In any case, the wisest move you can make is to phone the Gates Rubber Engineer. (Just look under "Gates Rubber" in your phone book.) He will come right to your plant—will thoroughly analyze any drive problem you may have—and he will always recommend the practice that will be most efficient and economical for you.

4412

THE GATES RUBBER COMPANY

*Engineering Offices and Stocks in All Large Industrial Centers*

**GATES VULCO ROPE DRIVES**

CHICAGO 6, ILL. 549 West Washington
NEW YORK CITY 3. 215-219 Fourth Avenue
ATLANTA 3, GA. 738 C & S National Bank Building
LOS ANGELES 21, CAL. 2240 East Washington Boulevard
DENVER 17, COLO. 999 South Broadway
DETROIT 4, MICH. 9683 Grand River Avenue
PORTLAND 9, ORE. 333 N W 5th Avenue
DALLAS 2, TEXAS 1710 N Market Street
SAN FRANCISCO 3, CAL. 1090 Bryant Street

# TAMPTITE

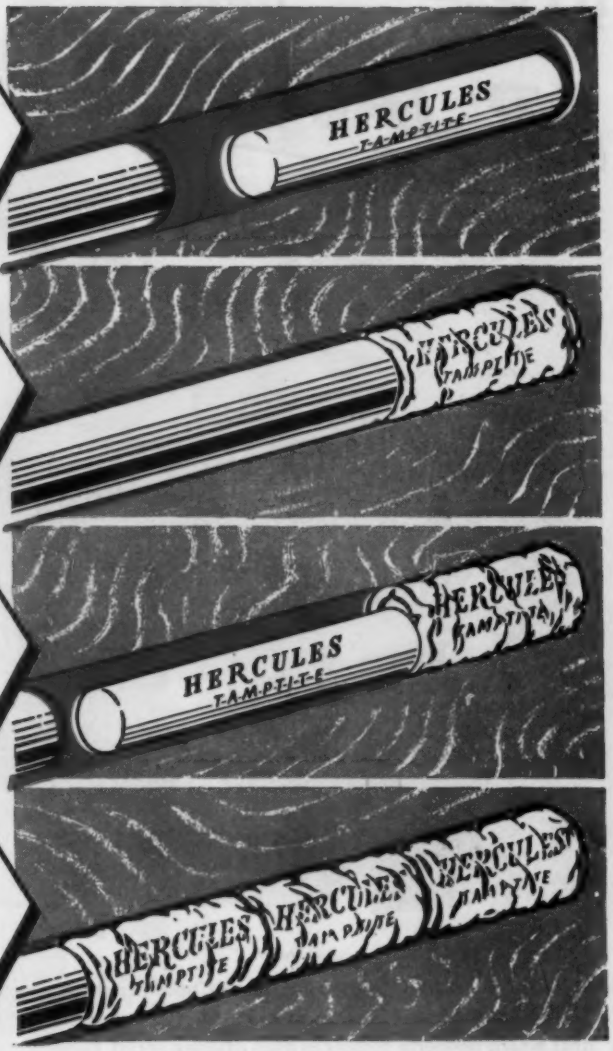
SAVES TIME · SAVES LABOR · PACKS SNUGLY · GIVES BETTER BREAKAGE

**1** With Tamptite, you load your favorite Hercules explosive into the bore hole in the usual manner. There's no need to split the cartridge. That saves time and eliminates loose, spilled powder.

**2** Next, the tamping rod compresses the dynamite in the hole, packs the charge tightly. There is practically no air space remaining around the charge.

**3** Insert another Tamptite cartridge. Then, simply tamp the same as the first cartridge. Continue inserting and tamping cartridges for whatever loading you wish.

**4** Your charge is concentrated snugly for maximum blasting effectiveness. The result is better breakage of ore or rock, speedier mucking, and a faster mining cycle.



Order your favorite Hercules explosives in Tamptite cartridges. All the customary grades and sizes of Hercules Gelamites*, Hercomites*, Extra Gelatins, Gelatins, and Extra Dynamites are available in this time-saving wrapper.

*HERCULES*

**EXPLOSIVES**

*REG. U. S. PAT. OFF. 28-45

*HERCULES POWDER COMPANY* INCORPORATED .... 946 KING STREET · WILMINGTON 99, DELAWARE

**ORDER HERCULES EXPLOSIVES IN TAMPTITE CARTRIDGES**

# "You Sure Get STEPPED-UP DRILLING with I-R JACKHAMERS"

**A JACKHAMER FOR EVERY JOB**

| Model | Weight Class |
|---|---|
| JB-30 | 30 lb. |
| JA-35 | 35 lb. |
| JB-4 | 45 lb. |
| JB-5 | 55 lb. |
| S-68 | 65 lb. |
| X-59 | 80 lb. |

*Stepped-up drilling* means more feet of hole per shift. There is only one way to attain it—by using a rock drill which properly combines high drilling speed, easy holding, and the ability to stand up to hard work.

Ingersoll-Rand engineers have successfully designed this combination of essential qualities into the I-R line of Jackhamers.* That is why these machines are so popular with contractors, mining men, quarry operators, and the armed services. Ask any of them!

When you put Jackhamers to work, you take advantage of advanced rock drill design and reliable rock drill service. Your drilling is stepped-up and your upkeep costs are lowered. Consult our rock drill engineers for help in selecting the right size and type for your particular job. They know the local conditions.

**If it's a Jackhamer, it's an Ingersoll-Rand (the word Jackhamer is a registered I-R trademark).*

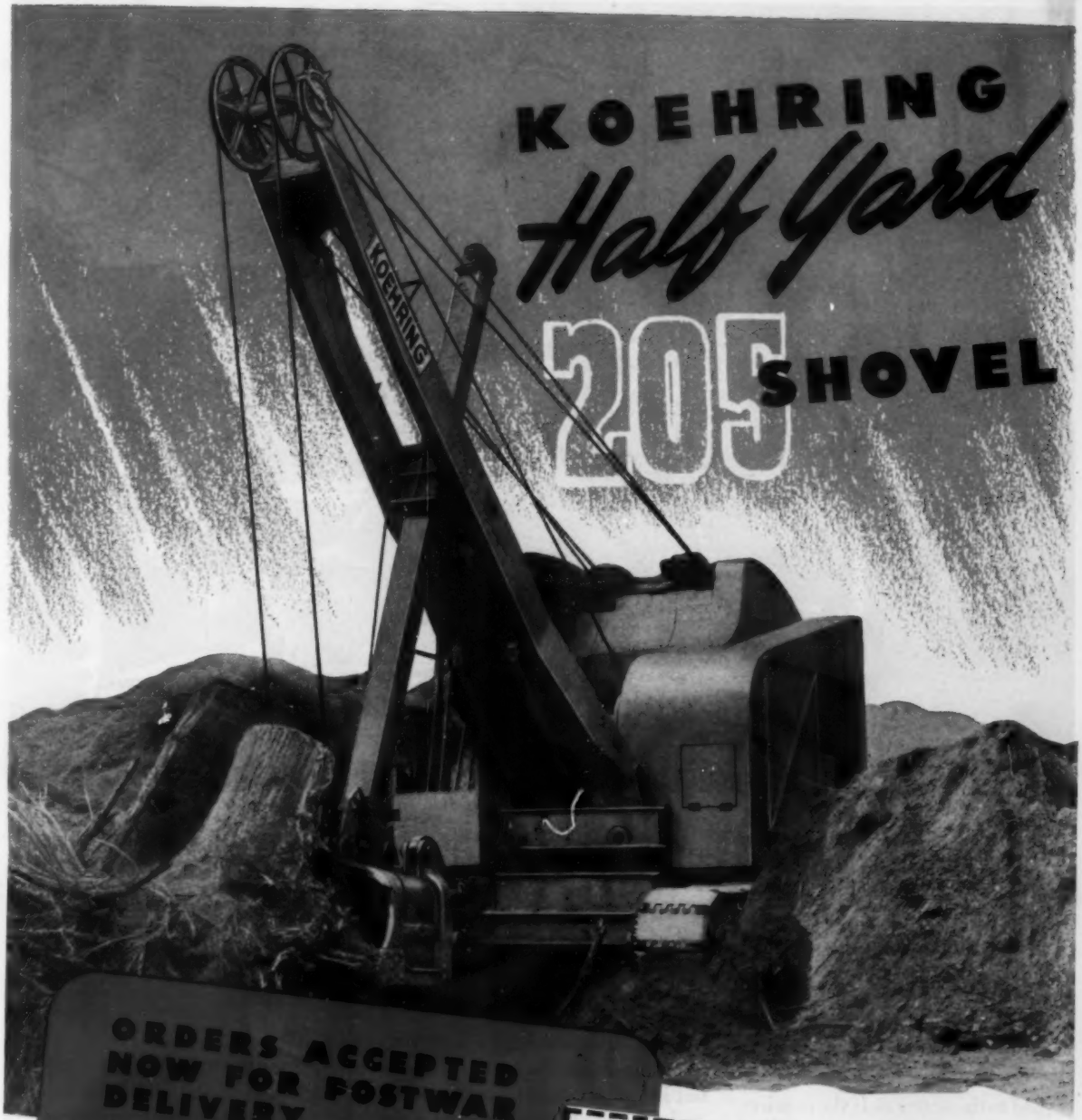
★ ★

**Ingersoll-Rand**

11 BROADWAY, NEW YORK 4, N. Y.

5-392

COMPRESSORS • TURBO-BLOWERS • ROCK DRILLS • AIR TOOLS • CENTRIFUGAL PUMPS • CONDENSERS • OIL AND GAS ENGINES




ORDERS ACCEPTED NOW FOR POSTWAR DELIVERY

WRITE TODAY FOR DESCRIPTIVE BULLETIN

*Use the Coupon . . .*

KOEHRING COMPANY, Dept. Y,
3026 West Concordia Ave.,
Milwaukee 10, Wisconsin.

Please send New 205 Shovel Bulletin

Firm Name_____

Individual Name_____ Title_____

Street Address_____

City_____ Zone____ State_____

KOEHRING HEAVY DUTY

ARMY (E) NAVY

**HEAVY-DUTY CONSTRUCTION EQUIPMENT**

# Two on the Aisle at the Beach-Head Bijou

The empty rope reels our fighting men sometimes use in their improvised theatres can mean but one thing . . . that our engineers are using plenty of tough, dependable wire rope in the operation of cranes, shovels, draglines and bulldozers.

Add to these demands the requirements of the industries providing supplies for our fighters, and it's easy to see that in spite of greater production there still isn't enough Wickwire Spencer Wire Rope to meet all demands.

To help conserve wire rope we suggest that you send for copies of our book, "Know Your Ropes," which is packed with ideas to help make wire rope last longer. And, when you do need rope, get WISS-COLAY *Pre*formed. It not only lasts longer than the non-preformed, but it's easier to cut, splice and install; it's kink-resistant and safer to handle.

If you have a particular wire rope problem our wire rope engineers will be happy to be of service. Write Wickwire Spencer Steel Company, 500 Fifth Ave., New York 18, N. Y.

PROPER SHEAVE LOCATION LENGTHENS ROPE LIFE

Increasing the distance between the main sheave and the drum will reduce side wear of the rope. This and 39 other wire rope life savers; 78 "right and wrong" illustrations; 20 diagrams and charts—are all in our 82 page book, "Know Your Ropes."

SEND FOR YOUR FREE COPY

*Send your wire rope questions to:*

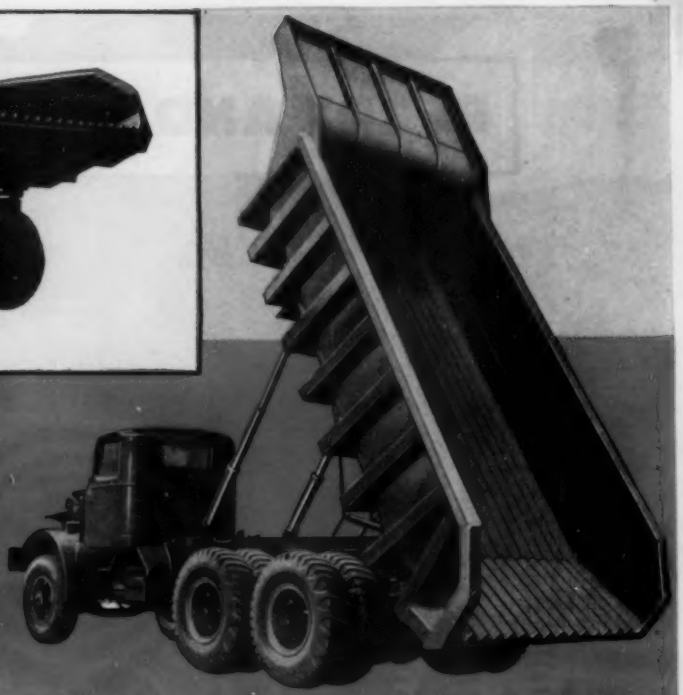
**WICKWIRE SPENCER STEEL COMPANY**

500 FIFTH AVENUE, NEW YORK 18, N. Y.

Abilene · Buffalo · Chattanooga · Chicago · Detroit · Houston · Los Angeles · Philadelphia · San Francisco · Tulsa · Worcester

Body with open or scoop and (Right) Same body elevated.

# X-112 BODIES *and* T-4440 HOISTS *for* OPEN PIT MINING



Body with automatic downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden, ore and coal.

## SPECIFICATIONS

HOIST—Hydraulic, twin cylinder, telescopic.

PUMP—Gear type with aluminum wearplates.

POWER-TAKEOFF—2-gear single speed.

BODY—Heavy duty with pressed-steel, box-type side braces and cross members.

BODY SHELL—¼" sheet steel with 2" wood filler.

WEARPLATE—¼" with floor angles or 5/16" without. Longitudinals 8-inch "H" beams.

CAB SHIELD—¼" plate.

FLOOR ANGLES—Optional.

Automatic gate opens as body elevates.

**GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan**

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

# READY AND WAITING

This Mack Model FC six-wheeler, with a capacity of 30 tons, is the largest standard truck built. It is especially adapted for use in quarries and strip mines, and for hauling of nickel, copper, iron and other ores.

THE post-war world won't be handed to us ready-made . . . but there will be a ready and waiting market for quarry and mining products. Housing, highways, perhaps new peacetime factories, dams and power-plants will keep supplier and builder busy for years.

Because of their proved ability to haul large tonnage at low cost, heavy duty motor trucks will have a vital part in this work, and far-sighted operators of modern mines are already giving close study to the selection of truck equipment best suited to their particular needs.

Plan *your* future operations now . . . with the advice of our engineers, men who know the job you face, and the kind of truck best fitted to do it. Address your inquiry to Public Works and Mines Division, Mack Trucks, Inc., 350 Fifth Ave., New York 1, New York.

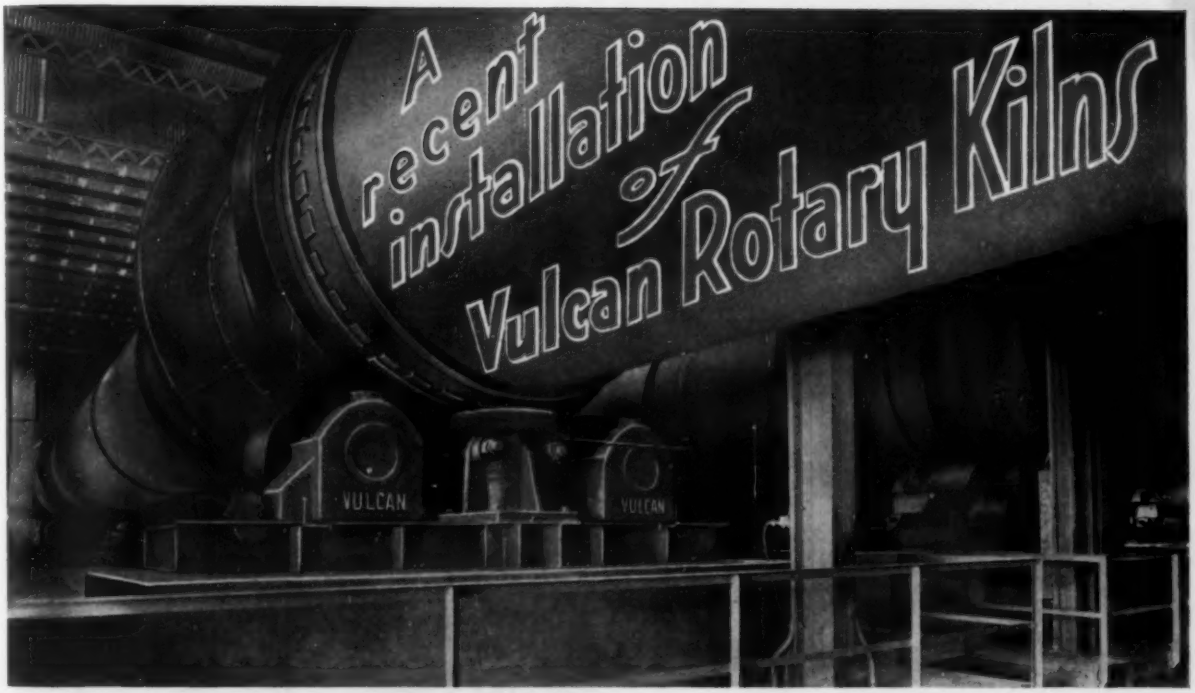
**Mack**

**TRUCKS**
**FOR EVERY PURPOSE**
ONE TON TO FORTY-FIVE TONS

*BUY U. S. WAR BONDS*

*Mack Trucks, Inc., Empire State Bldg., New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N.Y. Factory branches and dealers in all principal cities for service and parts.*

**IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!**




# Data that's not in the books:

- ROTARY KILNS, COOLERS AND DRYERS
- ROTARY RETORTS, CALCINERS, ETC.
- FEEDERS, ELEVATORS, SCREENS, ETC.
- CRUSHING ROLLS, PULVERIZERS, AND GRINDING MILLS
- BRIQUETTING MACHINES, DOUBLE-ROLL TYPE
- IMPROVED VERTICAL LIME KILNS
- QUICK-LIME HYDRATORS
- ELECTRIC HOISTS OF MANY TYPES
- SHAKING-CHUTE AND CHAIN CONVEYORS
- CAST-STEEL SHEAVES AND GEARS
- INDUSTRIAL LOCOMOTIVES OF ALL MODERN TYPES

For nearly half a century Vulcan engineers have been designing Rotary Kilns, Coolers, Dryers, Retorts, Calciners, etc. for the rock products, chemical processing and metallurgical industries. Predominant, throughout all this long period, in the manufacture of cement and lime, Vulcan rotary cylinders and accessory equipment are widely used, also, for the nodulizing and desulphurizing of ores, dehydration of bauxite, alteration of barytes, calcination of lithopone, processing of pigments, recovery of lime from paper-mill sludge, soda ash from black liquor, coke and other by-products from oil sludge, etc.

At the present time virtually all of the highly strategic materials—aluminum, magnesium, vanadium, synthetic rubber, etc.—upon which an allied victory depends, are processed, at one or more of their production stages, by Vulcan equipment and our engineers have acquired a vast fund of important operating data which can be applied to the processing problems of any concern whose products might contribute to the allied war effort.

Write us regarding any manufacturing or processing problem within the scope of the Vulcan equipment here listed. Constructive suggestions, estimates and preliminary designs will be furnished as promptly and completely as possible, without charge or obligation of any kind.

VULCAN

NEW YORK OFFICE
50 CHURCH STREET

IRON WORKS

WILKES-BARRE • PA.

## And the man who foots the bill would worry too—

Taylor Spiral Pipe isn't light enough to "float through the air" But it *is* light enough to make a real cut in the initial cost, handling cost and erection cost of piping.

If Taylor Spiral Pipe had only lightness to recommend it—if it weren't also strong and rugged to a remarkable degree—the economy of this light wall pipe would be narrowed down to a limited field of application. But the fact is that the spiral construction makes it the strongest type of pipe of its weight . . . enables it to handle a large percentage of the services ordinarily performed by far heavier and more costly Standard Thickness pipe.

Note the suggested uses for Taylor Spiral Pipe listed below. These are the everyday moderate and low pressure services for which Standard Thickness pipe is ordinarily used. Why? . . . Simply because too many plants still follow the old tradition of using everyday pipe for everyday uses! By uprooting the heavy pipe habit — using Taylor Spiral Pipe for uses like those listed—you can cut the installed cost of piping way down . . . in many cases to half that of Standard Thickness pipe.

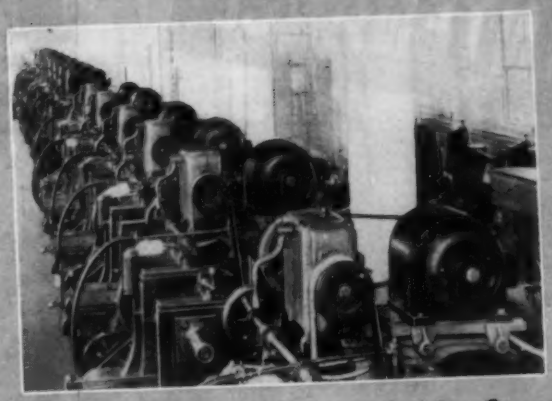
Switching to Taylor Spiral is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 18 to 6 gauge; sizes from 4 to 42 inches; joint lengths up to 40 feet. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service with undivided responsibility.

TAYLOR FORGE & PIPE WORKS
General Offices & Works: Chicago, P. O. Box 485
New York Office: 50 Church St.
Philadelphia Office: Broad Street Station Bldg.

**CHANGE TO TAYLOR SPIRAL PIPE FOR:**

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

# BEARINGS BEAR UP

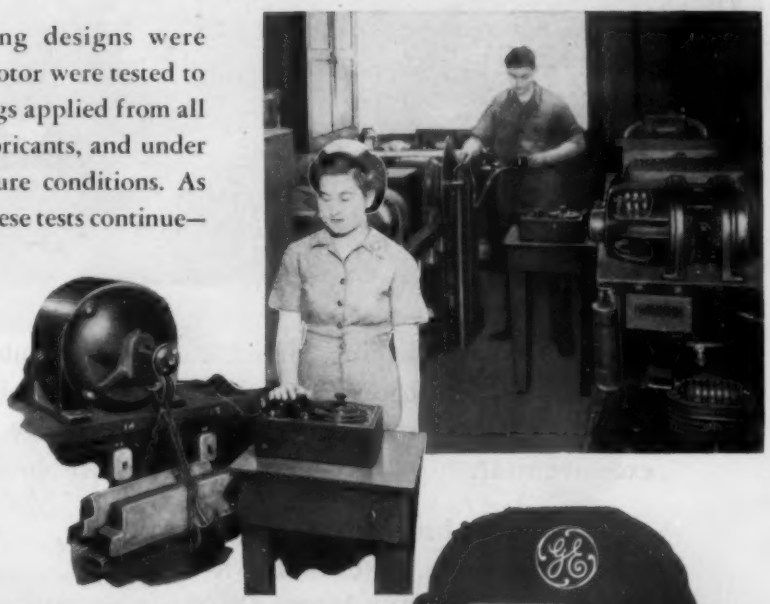


Powered by Tri-Clad sleeve-bearing motors, this battery of milling machines has been in round-the-clock operation on war work since before Pearl Harbor. The short-center, hinge-base drives put a hard, steady pull on the motor bearings. In addition, the machines are in the hands of several different operators each day, many newly trained. Despite the severe service, motor-bearing performance has been above prewar levels. Maintenance manpower has been conserved, and production held on schedule.

Tri-Clad motors driving milling machines in the River Plant Division of the Savage Arms Corp., Chicopee Falls, Massachusetts.

## How torture tests on TRI CLAD bearings have helped us lengthen motor life

Before the Tri-Clad motor-bearing designs were adopted, many models of this new motor were tested to destruction under heavy shaft loadings applied from all directions, with various kinds of lubricants, and under many different speed and temperature conditions. As new Tri-Clad types are introduced, these tests continue—some for years—in "torture" areas such as shown at right. Each test broadens our knowledge, offers new clues to longer motor life. Throughout industry, results have substantiated the improved bearing performance forecast by these tests. *General Electric Company, Schenectady 5, New York.*



GENERAL ELECTRIC

TRI CLAD MOTORS

Buy all the BONDS you can — AND KEEP ALL YOU BUY

# BETTER LUBRICATION *means* BETTER MAINTENANCE

IF you are experiencing difficult maintenance, better check lubrication. It may be inadequate with resultant excessive wear.

Sinclair offers better lubrication for better maintenance. SINCLAIR PENNSYLVANIA and OPALINE MOTOR OILS give safe lubrication in the hard grind of full load operation. TEN-OL 200 efficiently lubricates Diesels and Diesel-powered buckets and shovels.

• • •

*(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)*

## SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Typical of the exhaustive field tests which marked the development of the modern, high speed Cummins Diesel, was the gruelling 14-day grind which came to an end on Christmas Day, 1932, at the Indianapolis Speedway. Here, under AAA supervision, a Cummins-powered Indiana truck set a non-stop distance record for trucks: 14,600 miles (5,840 laps of the 2½-mile oval!).

The injector cup wiper is an inconspicuous part of the Cummins Diesel, but its development made a conspicuous contribution to the Cummins Diesel's efficient and economical performance. This patented cup wiper, perfected only after countless modifications in piston design, eliminates carbon on the injector cup, creates additional turbulency, assures more complete combustion.

Metallurgy plays an important role in the Cummins Diesel trend to ever lighter, stronger construction. Example: 5,000 samples were analyzed in selecting the cast iron for the block—a foundry was rebuilt and its methods completely revised—but the increase in tensile strength from 20,000 to 50,000 pounds per square inch more than justified the cost.

**CUMMINS DEPENDABLE DIESELS**

*Automotive Models:* Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

*Industrial Models:* Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

*Marine Models:* Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

# Spade Work

The diesel's higher thermal efficiency was proved many years ago . . . but it took the builders of Cummins Diesels to prove that diesel engine weights and dimensions could be brought within practicable limits. They proved it in 1932 with the original high speed diesel . . . proved it after 14 years of intensive "spade work" in the refinement of lubrication, cooling, metallurgy and many other aspects of design and construction . . . proved it by putting diesels in equipment and on jobs where diesels had never worked before. Today, you will find diesels in virtually every automotive, industrial, and marine service that requires heavy-duty power . . . and if you look closely enough, you'll find a very large proportion of those diesels are Cummins Dependable Diesels.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

N. Y.

# THE ANSWER TO *Higher* READY-MIX *Profits...*

**NOBLE HIGH SPEED PLANT** at Watsonville, California, operating continuously at sack-a-second speed for Pacific Portland Cement Co.

This **NOBLE DISTRIBUTION PLANT,** one of five owned by Halliburton Oil Well Cementing Co., batches from either silo at the touch of a lever. Distribution plants available with up to eight silos, with centralized control.

## THE *Speed and Accuracy* OF

## NOBLE
## BULK CEMENT PLANTS

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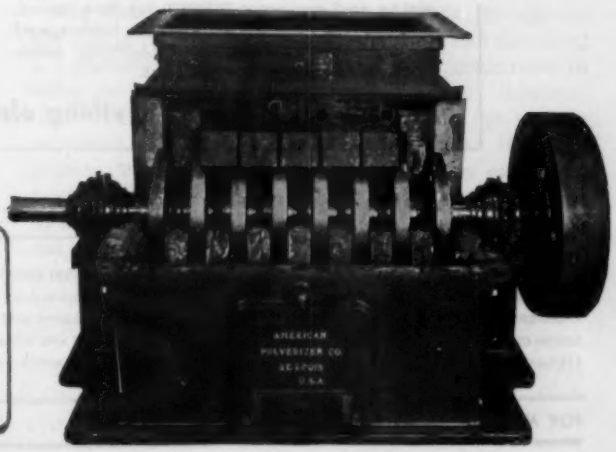

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UNDER the restrictions of war-time priorities, many plants have been forced to "get by" with over-worked, over-aged equipment. When these restrictions are removed, after Victory, there will be a wild scramble for new equipment—with inevitable delivery delays. Such delays may seriously affect operations at a time when competitive conditions will demand the fullest measure of efficiency.

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ROCK PRODUCTS

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# PAN-AMERICAN OPPORTUNITIES

PAN-AMERICAN countries are supposed to offer lucrative opportunities for American industry after the war. We hear much in the press of the need, and desire, of these countries for expansion of their domestic industries, in an endeavor to secure some degree of self-sufficiency. Little information has been available on the non-metallic minerals industries in Central America and South America, so we have surveyed these industries in this issue. Our articles are the result of a 60-day trip through all Pan-America by Victor J. Azbe, of ROCK PRODUCTS' editorial staff.

We knew these countries were backward, by our own standards, and the majority of rock products operations proved to be vastly inferior to ours. However, there are a number of reasonably modern cement mills and other unusual, versatile operations. Certainly, the ingenuity of some Pan-American producers, operating under adverse conditions, and their intense desire for betterment are of interest to us.

In reading the various articles in this issue, which tell of extremely low wage levels, high fuel costs per unit of production and widespread plant inefficiency, it is difficult to believe that these countries would lead us in anything pertaining to construction. Yet, cement is more widely used in Argentina, for example, than in the United States and the big South American cities are doing things in concrete that should open the eyes of designing engineers in the United States.

Construction favors concrete, due to the scarcity and high cost of steel structural members, so these countries, notably Argentina and Brazil, are far ahead of us in applications for reinforced concrete. For the same reasons, of necessity, unreinforced concrete is favored unless unusual local conditions compel building codes to specify steel reinforcing. Then the rule seems to be to use extremely light wire reinforcing and the less of it the better.

Where else could we see twenty-four story, all-concrete buildings with little or no steel reinforcing, even in the footings? We recently had the privilege of seeing slides of such structures in South America. Extensive use is made of thin concrete sections, extremely long reinforced concrete spans, and roof slabs, trusses and purlins precast on the job. And concrete is used for special designs where beautiful architectural treatment alone is the objective, even to having ordinary market buildings that look like cathedrals. Everything is of concrete and we are told the buildings are standing up, despite the departure from design standards as practiced in our country.

This might be of more than passing interest to design engineers in the United States, and to the benefit of cement and aggregates, in the conservation of our rapidly depleting reserves of high grade iron ore. They say we have only a few years' supply of high grade ore remaining in Minnesota's Mesabi iron range. Surely, our own wartime experience has proven that many "new" things can be done in, and made of, concrete if we have to do it.

Incidentally, in many of the outstanding concrete buildings in South America, the aggregates are crushed stone and "beach sand." Most authorities who have inspected these structures rave about the quality of the concrete, yet the beach sands have no gradation of particles such as we require. In fact there is a uniformity of grain sizes.

### Pan-American Needs

What Pan-American countries need most from us is technical assistance and machinery. With these two contributions after the war, will come new developments in the rock products industries and the construction of more roads like the Argentinian system, which will make accessible now undiscovered sources of mineral wealth that will lead to greater prosperity.

There is a surplus of labor and wages are ridiculously low. Yet, the cost of living generally is above normal, which complicates the economic situation. Two or three times as many men are required to do a given job, compared to our standards, a practice that cannot contribute to economic prosperity. The $24 a ton lime mentioned in Mr. Azbe's articles is a good example of how to stifle, not build, volume sales.

While cement manufacture is fairly well advanced, the status of the rock products industry as a whole is in the transition period toward scientific operation. There is a wonderful opportunity for the widespread use of limestone in agriculture in South America, and the field for chemical usage of lime and other rock products will develop as manufacturing industries grow. Business in some of the countries is booming, and there actually are serious shortages of cement and other rock products in several areas.

The thirst for self-sufficiency is great throughout the Pan-American countries. El Salvador has abolished a 6 percent tax on net profits of stock companies in order to stimulate industrial expansion. However, these countries, like China, invite our aid but want it regulated, to guard against exploitation of their resources. Prices to South American industry cannot be anything like the $378 per ton charged for steel plate in 1943, if the objective of bringing the Pan-Americas out of the wilderness is to be realized. Certainly, fair trade practices with our southern neighbors will help solve our own re-employment problem.

Bror Nordberg

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# Washington NEWS

TO PROVIDE a centralized point of control over all matters pertaining to construction within the War Production Board, a Construction Bureau has been established, responsible to Hiland B. Batcheller, Operations Vice-Chairman. The bureau will be headed by Arthur J. McComb, Montclair, N. J., who has been serving as director of the Office of Industry Advisory Committees. The Construction Bureau will include the existing Building Materials Division, the Construction Machinery Division, the Plumbing and Heating Division and the bulk of the Facilities Bureau, which is being abolished.

A Bureau Requirement Committee is being established to pass on all construction requirements and construction programs and all major construction projects. It will also review the requirements of the divisional requirements committees of the component divisions of the Construction Bureau. Appeals from its determinations will be taken only to the Central Requirements Committee of W.P.B. The Materials Control Division, the Project Analysis Branch and the Tax Amortization Branch of the Facilities Bureau's Project Essentiality Division are being transferred to the Construction Bureau.

### Lime or Gypsum Prices

Under Amendment 60 to Order A-1, MPR 188, any producer of lime or gypsum products may, subject to the filing provisions of subdivision (IV), offer to sell, sell, and deliver any such products to any other producer at a price agreed upon by the selling and buying producers, when the price so agreed upon is in excess of the maximum price for the seller under MPR 188, under certain conditions.

The conditions are: the buying producer must sell the commodity in the same form as purchased from the selling producer; any increase in price resulting from the agreement must be absorbed by the buying producer and may not be reflected, directly or indirectly, in the resale price nor may such increase be used as a basis for a request for an increase in price by way of an application for adjustment or petition for amendment. Before any sale may be made upon the basis of the price arrived at, the buying producer must submit a statement to the O.P.A., Building Materials Price Branch, Washington, D. C., showing the names of the selling and buying producers, names of lime or gypsum products involved, and a statement from the buyer that the increase in price will not be passed on in the resale of the commodity.

### Request Elimination of Sand and Gravel from Price-Controlled Commodities

Executive Secretary V. P. Ahearn recently presented to the O.P.A. the formal application of the National Sand and Gravel Association for the removal of the sand and gravel production industry from the list of industries subject to price control. A letter was recently addressed to Karl Mathiasen, Price Executive, Building Materials Price Branch, seeking this action, and Mr. Mathiasen has replied that the request will be studied for consideration in the near future.

### Ready Mixed Concrete

On and after October 27, any manufacturer of ready mixed concrete may increase his established maximum prices per cubic yard for each specification of that commodity by an amount not to exceed his actual dollars-and-cents additional cost, rounded off to the nearest 5 cents per cubic yard, resulting from the price increase for sales of cement permitted by Amendment No. 6 to Maximum Price Regulation No. 224, effective April 20, 1944. The term "manufacturer" as used here means any person who makes the first sale of ready-mixed concrete.

Areas in which price increases were previously granted by O.P.A. to ready mixed concrete producers to compensate for the 20-cent a barrel increase in the price of cement are (1) Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, eastern Pennsylvania, Maryland, Delaware, Washington, D. C., the city of Alexandria, Va., and five counties in northern Virginia; and

(2) Michigan, Ohio, West Virginia, western Pennsylvania, a portion of eastern Kentucky, and the western tip of Virginia. (Amendment No. 59 to Order A-1 Under Maximum Price Regulation No. 188.)

Although O.P.A. was unwilling to accept the request of the National Ready Mixed Concrete Association that the relief accorded the industry in the Northeastern and Ohio areas should also be accorded producers in the Southern California area, it did agree to provide for a 30-day time lag between the announcement of the cement price increase and its effective date. The order was issued on September 14 and thus became effective on October 14. On October 20, the Regional Administrator of O.P.A. at San Francisco, Charles R. Baird, issued an order affording relief to ready mixed concrete producers in the California Counties of Los Angeles, San Bernardino, Riverside, Orange and Fern. Decision as to the other areas has been postponed.

### Repair Parts for Crawler Type Tractors

Owing to a shortage of repair parts for track-laying tractors for defense purposes, W.P.B. has issued General Limitation Order L-53-b, as Amended October 23, 1944. The purposes of this order are to regulate the sale and delivery of repair parts for tractors: to prohibit tractor owners from getting more repair parts than they actually need: and to allocate deliveries of repair parts between military and non-military purchasers. A producer, dealer or distributor must not sell or deliver repair parts to any person except for export unless he has received from such person an emergency certificate, in accordance with Order L-53-b.

### Concrete Products 1943 Figures

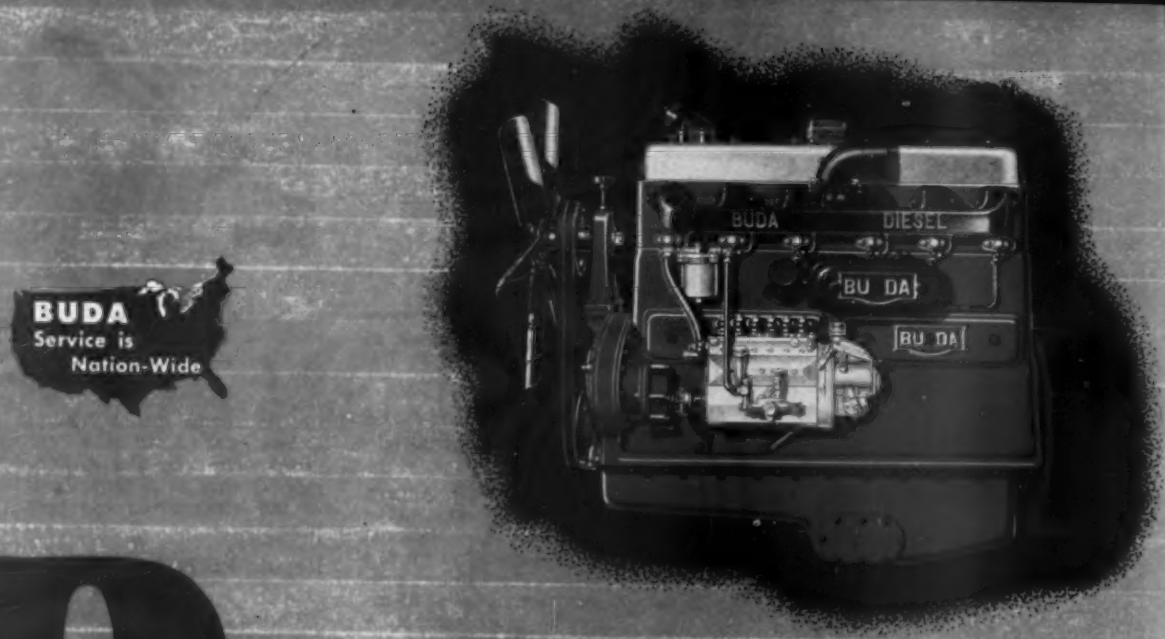
Production of 267,479,081 concrete blocks was reported by 1,374 plants in 1943, according to a survey just completed by the War Production Board's Building Materials Division, Clay and Concrete Products Section. The plants reporting represented a major coverage of production.

Production of other concrete masonry products in 1943 was: lintels and sills—22,684 tons; joists—3,838 tons; roof slab and tile—17,346 tons; manhole fittings—23,848 tons; septic tanks — 10,262 tons; brick — 65,191 tons; and silo slabs—67,578 tons.

Heavy-weight aggregate blocks accounted for 145,582,018 units or 54 per cent of the total concrete block production; light-weight aggregate blocks accounted for 121,897,063 units. Production figures were computed in 8- x 8- x 16-in. equivalents.

In a similar survey conducted by W.P.B. Building Materials Division for 1942, a total of 301,096,071 concrete blocks were produced by 1,695 plants, of which 170,582,950 or 56 percent were heavy-weight aggregate blocks and 130,513,121 were light-weight aggregate blocks. Plants reporting on 1942 production represented approximately 75 percent of the industry.

*(Continued on page 136)*

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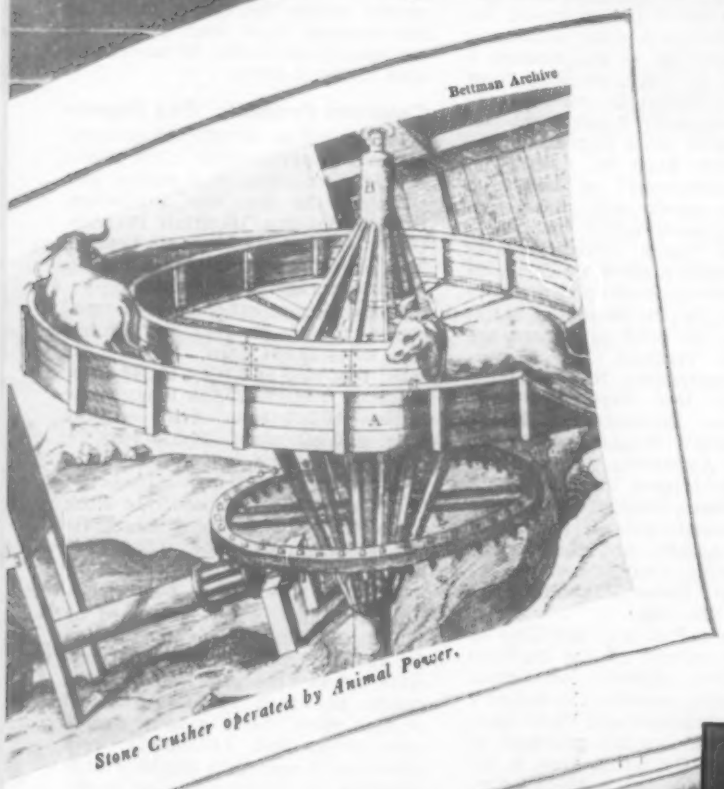


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# How Much Free Enterprise?

ONE OF THE RESULTS of a trip to Los Angeles last summer was a presentation copy by W. J. Van Valkenburgh, president of the Blue Diamond Corporation, of a 165-p. book entitled, "Do We Want Free Enterprise?", being a series of lectures by Dr. V. O. Watts, economic counsel of the Los Angeles Chamber of Commerce. It is printed as No. 1, Vol. 2 of "The Economic Sentinel," by the Los Angeles Chamber of Commerce, and sells for 50c per copy or in 100-copy lots for 30c.

I think every Easterner concedes that in some ways Pacific Coast business men are the most progressive type we have in our country. This book is proof that the members of the Los Angeles Chamber of Commerce are interested in other activities than those for which that institution is the butt of so many jokes. Its members are very serious in their desire to understand and to do constructive work with, rather than merely howl against, a social evolution or revolution which is perhaps more clearly apparent to them in the land of "ham-and-eggs" state pension proposals, than to their brethren farther east.

The purpose of the lectures, or lessons in economics for business men, by Dr. Watt, is best explained in the foreword of the publication by Leonard E. Read, general manager of the Los Angeles Chamber of Commerce. He writes: "Early in 1943 the officers and members of the Chamber, perceiving these basic reasons for our troubles, *seeing faults in ourselves instead of exclusively in others*, began a program of self-education in free competitive enterprise."

Now the faults in themselves that they saw were those that from time to time during the last several years, through editorials in ROCK PRODUCTS, we also have attempted to emphasize. The chief of these faults is that no two business men agree on a definition of free enterprise—at least the kind of free enterprise they want to see practiced. Consequently, as Mr. Read says, when called upon to discuss or debate the cause of free enterprise, a large majority of business men find themselves at a great disadvantage when pitted against radical labor leaders or collectivists.

So here is how the Los Angeles Chamber of Commerce has gone about correcting these faults, in the words of Mr. Read: "The program was simple. We formed a group of business men, big executives and little fellows, whoever was interested. A chairman to serve as a moderator was chosen. A member of our staff served as business manager. The group selected a day, most convenient to the majority, to meet once a week at luncheon time. We then selected an economist, a free competitive enterpriser at heart, skilled in his profession, reputed for his courage, his fairness and broad understanding of business, of government, of labor, of agriculture and of consumer interests. At each session the economist lectured on some phase of free competitive enterprise."

The idea spread and the book that we have before us is the series of fourteen lectures as given by Dr. Watt under the auspices of the Chamber of Commerce of Olympia, Wash. (They were attended and praised by labor leaders as well as by business men.) These lectures are given in the form of outlines—really various subjects to be considered, with comments following. These comments could be, and probably are, developed in much greater detail through questions and answers, and by contributions from those who take part in the sessions. Primarily of course they are designed to be thought-provoking, because it is only by *thinking*, that we make ourselves competent to deal with any problem. One object is to make business men use brains that they apply so successfully to their own enterprises to some of the broader issues of industrial development which face us all.

Dr. Watt's book is not copyrighted and his arguments and explanations are for the free use of anyone who wants to take up the banner of free enterprise. There is hardly a paragraph that a man of imagination could not expand into a lecture. For example, take this simple statement: "The primary test of an economic system is not the degree of liberty but its efficiency in supplying the needs and wants of its members"; and this proposition, which follows: "Progress for the masses can come about only as mass efficiency in production makes available mass supplies of the tools and opportunities necessary for better ways of living."

As a starter we should certainly be better informed on some of the many fallacies that have been so widely spread that numerous people already accept them as gospel. It's a long, long way to Utopia, but we do not get any closer to it by following blind alleys. Dr. Watt's book will teach the reader what some of these blind alleys look like in homely language that we all understand. For example, "can price control stop inflation?" How many of us understand what inflation is, since there are at least four kinds, and price inflation is only one?

Subsidies are the present sovereign remedies for trying to keep powerful political blocks satisfied. Dr. Watt describes them as "putting ice on the thermostat." Don't let the reader think this refers merely to agricultural subsidies. Tariffs are subsidies. And here is a frank statement: "When industries in which our labor is less relatively efficient ask for subsidies or tariffs, it is not merely because they need protection against the *foreigner*. It is equally due to their need for help against the competition of more efficient *home* industries which are bidding against them for labor, land, machinery and materials."

Enough has been quoted to show that Dr. Watt is frank and says some things business men may not like to read, as well as many they will take delight in. But, if we want to progress we have to recognize the force and merit of the other guy's argument as well as those of our own. As one observer at Olympia wrote Dr. Watt: "Business people are thirsty for a philosophy of business, a justification to themselves and others of the value of the thing they are trying to do, and an ability to distinguish right from wrong in business and economics." Well, here's your chance.

Nathan C. Rockwood

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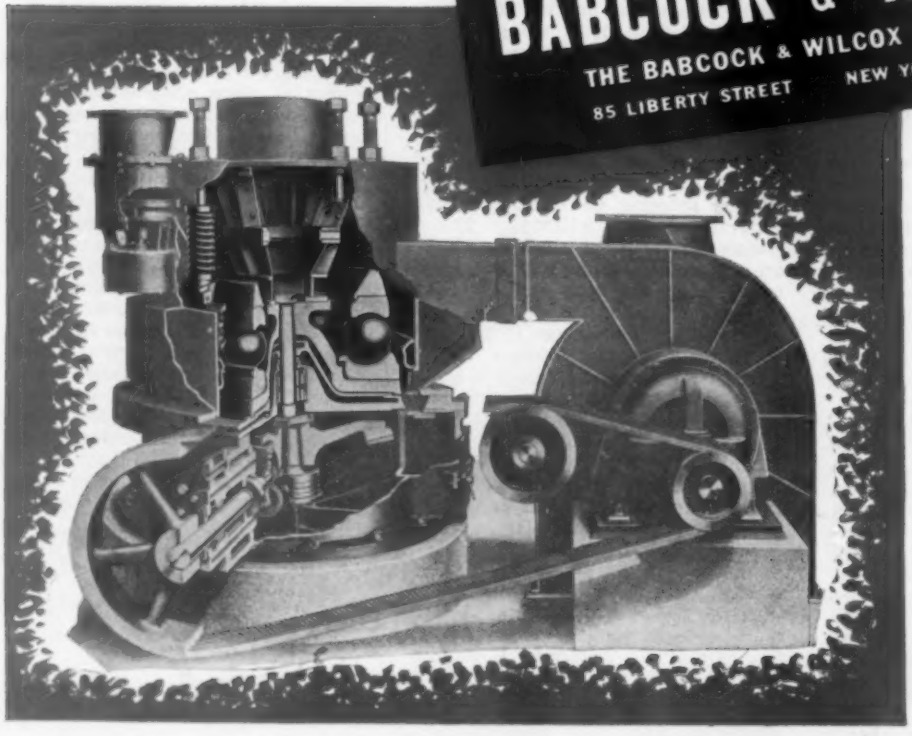

Cut-away view of the B&W Type E Pulverizer

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# News ABOUT THE INDUSTRY AND PEOPLE

## Becomes General Chemist

JOSEPH J. FOX, formerly chief chemist and chemical engineer with the Missouri Portland Cement Co.,

Joseph J. Fox

St. Louis and Sugar Creek, Mo., has joined the Glens Falls Portland Cement Co., Glens Falls, N. Y., as general chemist. Previous to his connection with the Missouri cement company, Mr. Fox spent ten years with the Lone Star Cement Corp. as assistant chemist at Texas, East Pennsylvania and Alabama plants, including two and one-half years in Argentina as manufacturing research chemist, and chief chemist of the Hudson, N. Y. plant. Mr. Fox is a graduate of Texas A. and M. and a member of the American Society for Testing Materials.

## Visitor from Argentina

ARTHUR C. HILLEGASS, vice-president of the Argentine Portland Cement Co., Buenos Aires, a subsidiary of the Lone Star Cement Co., New York, N. Y., who has been in the Argentine for 27 years, arrived in the United States recently for a brief visit in Allentown, Penn., and Hudson, N. Y. Mr. Hillegass' boyhood ambition was to be a chemist, in which subject he majored at Allentown High School, graduating in 1906. In August of the same year he started work in the laboratory of the Atlas Cement Co., Northampton, Penn. Five years later his family moved to Hudson, N. Y., and he was placed in charge of the physical laboratory of the Hudson plant. Later the Pittsburgh Testing Laboratory opened a Hudson Valley branch and he was put in charge. Through his work he struck up a close friendship with an engineer who in 1917 went to Argentina to build a cement plant for the Lone Star Cement Co. Mr. Hillegass went along with the understanding that if he learned to master Spanish he would be put in charge of the commercial end of the business. Two years later he became sales manager for the Argentine Portland Cement Co. In 1929 he was made manager, and four years later, in 1933, was elevated to the vice-presidency, which position he now holds.

## Consumers Changes

ROBERT C. FENNER, president of The Consumers Co., Chicago, Ill., has been elected chairman of the board and WILLIAM J. KELLY, a director of the company since 1942, has been made president. Mr. Fenner will continue as the chief executive of the company. Mr. Kelly is also president of the Kelly Steel Works, Inc., and a director of the Public Service Company of Northern Illinois.

## Chemical Engineer

WILLIAM P. WHITNEY, formerly combustion engineer, Missouri Portland Cement Co., Kansas City, Mo., is now the chemical engineer of the company's plant at Kansas City, Mo., succeeding Joseph J. Fox who has resigned to join the Glens Falls Portland Cement Co., Glens Falls, N. Y.

## Named Board Chairman

JOHN J. PORTER, formerly president of the North American Cement Corp., New York, N. Y., has been appointed

John J. Porter

Thomas J. Harte

chairman of the board of directors, and THOMAS J. HARTE, formerly executive vice-president, has been named president of the corporation.

## Killed in Action

CAPTAIN TYLER CAMPBELL, son of Bruce S. Campbell, president of Harry T. Campbell Sons Corp., Towson, Md., was killed in action recently on the Italian front. Two other sons are also overseas; Captain Bruce S. Campbell, Jr., is with the Army Air Forces in the South Pacific Area, and Robert M. Campbell is a volunteer in the American Field Service.

Captain Tyler Campbell had been cited by his commanding officer for gallantry in action in Italy last spring. His most recent military exploit was the liquidation of Maj. Gen. Schmidt, the much decorated German artillery officer. The German general was riding at the head of a motor convoy which turned a corner in an Italian village and ran into Captain Campbell's unit, which was preparing to set up a road blockade. There were five vehicles in the German convoy and Captain Campbell's men riddled it with machine gun fire.

## Gypsum Manager

FESTUS T. MCDONOUGH, manager of the Pacific Coast Division of the Gypsum Association, has been appointed manager of the newly-revived Standard Gypsum Co., Los Angeles, Calif. Wallace Riddell has been named chemist. These are the first administrative appointments with the Standard Gypsum Co. since Henry J. Kaiser and Samuel A. Perkins joined to operate the company.

## Cement Official Resigns

CHARLES T. RABER, general chemist at the Glens Falls Portland Cement Co., Glens Falls, N. Y., since 1937, has

Charles T. Raber

resigned to join the Giant Portland Cement Co., Egypt, Penn., as chemical engineer. Before coming to Glens Falls, Mr. Raber was senior chemist with the Pennsylvania Department of Highways and during World War I served in France as assistant chemist with Cement Mills Company No. 1. Born in Mechanicsville, Lehigh County, Penn., in 1893, Mr. Raber started his career in the cement industry as inspector and sample boy with the Coplay Cement Co. in 1907. Later he went to the Bureau of Standards laboratory and then to the laboratory of the Lehigh Portland Cement Co. at West Coplay, Ormrod and Fogelsville, Penn. Upon his return from France he took a position with the Pennsylvania Highway Department where he remained until 1937 when he accepted the position of general chemist and chemical engineer at the Glens Falls Portland Cement Co. Mr. Raber is a member of Committee C-1 of the American Society for Testing Materials. He is also a member of the American Concrete Institute and of the Technical Problems Committee of the Portland Cement Association.

## In Mexico

MARTIN A. ULDALL, former president of the Standard Gypsum Co., Los Angeles, Calif., is now in Mexico constructing a gypsum plant for Compania Yesera Nacional, S. A. J. C. Hassell, former superintendent of the Standard Gypsum Company's plant at Long Beach, Calif., is with Mr. Uldall and will serve as superintendent of the new plant after it is in operation. Mr. Uldall formerly was sales manager of the Pacific Portland Cement Co., San Francisco, Calif., and served as secretary of the Pacific Coast Division of the Gypsum Association.

## Elected President

HENRY W. COLLINS, vice-president of The Celotex Corp., Chicago, Ill., has been elected president of the Insulation Board Institute, succeeding Stuart H. Ralph, vice-president of the Flintkote Co., New York, N. Y. MARLAND S. WOLFE, advertising manager of U. S. Gypsum Co., Chicago, Ill., has been named treasurer.

## Association Officers

F. M. KETTENRING, president of the Graystone Concrete Products Co., Seattle, Wash., has been elected president of the Concrete Pipe and Products Association. JOHN R. SHERMAN of the Yakima Cement Products Co., Yakima, Wash., was named vice-president, and W. S. WILSON of the Graystone Materials Co., Olympia, Wash., was made secretary-treasurer. C. M. HOWARD is engineer-manager of the Association.

## Engineer for Yakima

ELLIS CUMMINS, district irrigation engineer for the Kittitas Soil Conservation District, Ellensburg, Wash., has resigned to accept an engineering position with the Yakima Cement Products Co., Yakima, Wash. His successor has not been named.

## Named Vice-President

ROBERT A. KINZIE, formerly chief engineer, Santa Cruz Portland Cement Co., San Francisco, Calif., has been appointed vice-president in charge of operations. He is now in charge of all plants, ships and other property of the company.

## Named Sales Manager

EDWARD J. HEAD has been appointed sales manager of the Universal Atlas Cement Co., New York, N. Y. FOSTER A. HAGAN will replace Mr. Head as assistant sales manager.

## Retires

E. A. PIERCE, manager of the Southern Phosphate Corp., Bartow, Fla., has retired after 40 years in the phosphate business.

## Resigns

DALE L. PITT, president of the Colonial Mica Corp., New York, N. Y., has resigned his position because of ill health and has returned to his home in Seattle, Wash.

## Gypsum Inspector

ARNOLD H. MILLER, consulting engineer of New York, N. Y., upon his return from Chihuahua, Mexico, will inspect examination work of gypsum deposits in the Death Valley district.

## Member Post-War Council

WILLIAM ROHLWING, district engineer, Portland Cement Association, Indianapolis, Ind., has been made a member of the Post War Public Works Council which has been formed to promote post-war planning of public work projects throughout Indiana.

## Resigns Mica Position

M. H. BILLINGS of Minneapolis, Minn., director of the mica-graphite division of the War Production Board, has resigned to accept a position with the foreign division of the National Carbon Co., Niagara Falls, N. Y., a subsidiary of Union Carbide and Carbon Co.

## Ideal Superintendent

J. G. LUTHER, acting superintendent at the Trident, Mont., plant of the Ideal Cement Co., Denver, Colo., has been appointed superintendent of the plant.

## Gold Star

CAPT. CHARLES A. WALLACE, owner and manager of the Wallace Concrete Pipe Co., Columbia, S. C., who joined the Army Engineer Corps in 1942, died recently from wounds received in action in the Pacific.

## Cement Official Retires

R. C. MATTHEWS, plant superintendent of the Marquette Cement Mfg. Co., Cape Girardeau, Mo., has retired after 34 years of service with the company. JAMES H. HOWE, who has been with the company for 21 years, has been appointed to fill the vacancy.

## Joins Products Concern

EARL A. SOLOMAN, formerly sales engineer with the Pennsylvania-Dixie Cement Corp., New York, N. Y., has joined the Hamden Building

Earl A. Soleman

Tile Co., Hamden, Conn., as products engineer of research and development.

## OBITUARIES

P. F. (PETE) STAUFFER, vice-president, Fuller Company, Catasauqua, Penn., died suddenly on Thanksgiving day. He was 55 years old. Mr.

P. F. Stauffer

Stauffer was widely known throughout the cement industry, and had been a regular attendant at Portland Cement Association meetings. He had not been in the best of health since last summer when he suffered a sunstroke, but apparently was on the road to recovery and had resumed his official activities. His death came as a great shock. Mr. Stauffer spent all of his business life selling to the cement industry. He started his career over 30 years ago with the old Fuller-Lehigh Co., which subsequently was sold to Babcock & Wilcox Co. in 1926, at which time he left to join the Fuller Company as general sales manager.

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JOHN M. SETTLE, president of the Ohio River Sand Co., Inc., Louisville, Ky., who was affectionately known as "Uncle John" to everyone in the industry, passed away October 6. He was 75 years of age. Mr. Settle was a pioneer in the industry and a faithful and hard-working member of the industry and its Association. As an expression of the regard with which the leaders in the industry held Mr. Settle, we are publishing below the telegram addressed to Mrs. Settle by V. P. Ahearn, executive secretary, and Robert Mitchell, president, of the National Sand and Gravel Association:

"All of us who have known and loved John Settle for so many years have learned with the deepest sorrow of his death. He was our intimate companion in the development of our industry and he leaves behind him a reputation for high devotion to business ideals and for honorable dealings with everybody. We shall always hold him in affectionate regard and Mrs. Ahearn joins me in offering deepest sympathy to you and to your family."

"Have just learned of John's death. He was a splendid man and a real friend. He was loved by members of our industry over the entire country. My sincere sympathy."

Mr. Settle was one of the organizers of the Ohio River Sand Co., Inc., which was formed in 1891. He served as secretary until 1931, at which time he became president. A son, Caldwell Settle, also an executive of the company, died following a heart attack about three years ago.

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WILLIAM J. SEWELL, director of the Whitehall Cement Mfg. Co., Philadelphia, Penn., died September 30 in Boston, Mass., while en route from a vacation in Maine. He was 70 years of age.

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EARL A. BURR, vice-president, Cleveland Quarries Co., Cleveland, Ohio, died recently at the age of 66. Mr. Burr started his business career as assistant auditor of the Cleveland Stone Co. which later became the Cleveland Quarries Co.

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GEORGE M. MAHAR, organizer of the Mahar Bros. Slate Manufacturing Co., Inc., Fair Haven, Vt., died October 10. He was 64 years old. Mr. Mahar was born in North Poultney, Vt., and educated in the public schools in Fair Haven. In 1904 he and his brothers organized the slate manufacturing company.

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WILLIAM R. DUNN, former general manager of the Vulcanite Portland Cement Co., Philadelphia, Penn., with which he became associated in 1896, passed away November 1. Mr. Dunn was the holder of a number of patents pertaining to the manufacture of cement.

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EDWARD NEWMAN VANCE, head of the E. M. Vance Mica Co., Spruce Pine, N. C., died recently. He was 62 years of age. Mr. Vance formerly was associated with the Colonial Mica Co. and Consolidated Mica Co.

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G. B. LIVINGOOD, advertising manager of the Traylor Engineering and Manufacturing Co., Allentown, Penn., and editor of "The Traylorian," house organ of the company, passed away recently.

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JUDGE BERNARD MASON, president and vice-president of the Ripplemead Lime Co., Pearisburg, Va., died October 22. He was 75 years old. Judge Mason received his legal education at the University of Virginia and was appointed Judge of the Circuit Court of Giles and Bland County, Virginia, in 1898. He practiced law successfully for a number of years but in later years devoted the major portion of his time to his business interests. He was also president of the Minter Homes Corp., Mingo Lime and Lumber Co., and New River Lumber Co. He was instrumental in the founding of all of these companies. Judge Mason's two sons, D. W. Mason of Pearisburg, Va., and George E. Mason in Blaksburg, Va., are actively engaged in the lime and lumber business.

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B. J. LATIGER, who retired in 1943 from active service with the Ideal Cement Co., because of ill health, passed away in Glendale, Calif., recently.

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JOHN C. DIRIGO, who was associated with his father in the operation of a stone quarry near Monroe City, Mo., died recently at the age of 79.

## Cement Production

BUREAU OF MINES reports that production of finished portland cement during September, 1944, totaled 8,746,000 bbl. or 23 percent below production in September, 1943. Mill shipments during September, 1944, totaled 10,221,000 bbl. or 17 percent below the mill movement in September, 1943.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of September, 1944, and of September, 1943:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

| | Sept. 1943 | Sept. 1944 | Aug. 1944 | July 1944 | June 1944 |
|---|---|---|---|---|---|
| The month | 56.0 | 44.0 | 44.0 | 41.0 | 40.0 |
| 12 months | 62.0 | 39.0 | 40.0 | 41.0 | 43.0 |

## Pavement Yardage

AWARDS of concrete pavement for October, 1944, have been announced by the Portland Cement Association as follows:

SQUARE YARDS AWARDED DURING OCTOBER, 1944

| | Sq. Yds. |
|---|---|
| Roads | 238,427 |
| Streets and alleys | 509,555 |
| Airports | 456,075 |
| Total | 1,204,057 |

## Open Cement Plant

THE PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., has resumed operations at the Gold Hill, Ore., plant after several weeks' shutdown. However, the men were employed at the new power plant being built by the cement company on Rogue river.

## Organize Agstone Producers

MISSOURI agricultural limestone producers held a meeting on October 25 at Columbia, Mo., for the purpose of forming an association of the 150 agstone producers and distributors in the State. The meeting was addressed by Arnold Klemme of the Department of Soil, Missouri College of Agriculture, who said that there was an annual need of over 4,000,000 tons of limestone for Missouri. He stated that experiments at the College of Agriculture had shown that at the prevailing cost of limestone, farmers received a return of $3 to $6 for every dollar expended for limestone. John Kendrick of the Missouri Agricultural Conservation Committee also addressed the meeting. Roy E. Mayes, Carthage, Mo., was appointed chairman of a committee to prepare articles of incorporation and by-laws for the new association.

## Quarry Pay Up

THE KANSAS CITY regional War Labor Board recently adjusted a former decision in reconsideration of wage demands of 250 workers in 10 quarries centered around Kansas City, Mo. A 5-cent an hour increase was granted which will be retroactive to October 1, 1943, when the old contract between the two disputing unions and the companies expired. The unions originally had asked for a 17-cent an hour increase. After the men struck, the order of the W.L.B. denying the requested increase was held up until the men were back to work and had filed an appeal. The unions involved were the Heavy Construction Laborers' Union, local No. 663, and the International Union of Operating Engineers, local No. 101, both affiliated with the A. F. of L.

## Testing Gravel

COUNTY SURVEYOR Lou Adams, Omaha, Nebr., has recommended that frequent physical tests be made during delivery of the 41,000 tons of gravel recently purchased by the County Board. It was recommended that the Omaha Testing Laboratories test samples of every 50 tons of gravel delivered, for clay, wood, and other foreign matter. Under his proposal, county gravel inspectors would take samples to the laboratory at a charge of $1.25 a test.

## Agstone Shortage

HOPKINSVILLE STONE CO., Hopkinsville, Ky., has been working to capacity producing agricultural limestone, but deliveries to farmers have been held up due to shortages of machinery, labor, and trucks. A. W. Partee, president, has announced that crushing capacity for agstone will be doubled when a new crusher is obtained. This crusher, to be installed this winter, will have a capacity of 40 to 50 tons an hour of agricultural limestone. Since the closing of the Cook Stone Company, the Hopkinsville Stone Co. is the only quarry operated in Henderson County.

## Open Sand Pit

THE TUXCORA SAND CO. will operate a sand and gravel pit on the former John Geckler farm near Zoarville, Ohio. Stripping operations have been started.

## Buys Gravel Pit

LOUIS LUEHRING, Hanover, Kans., has purchased the former Westover gravel pit southwest of the city from Otto Schroeder of Hanover. The property was formerly operated as the Washington County Sand and Gravel Co. Mr. Luehring plans to continue operations.

## CONVENTIONS COMING

**American Institute of Mining and Metallurgical Engineers, Annual Meeting, Pennsylvania Hotel, New York, N. Y., February 18-22, 1945.**

**Highway Research Board, National Research Council, Annual Meeting, Netherland Plaza Hotel, Cincinnati, Ohio; postponed indefinitely.**

**National Concrete Masonry Association, Annual Meeting, Hotel Sherman, Chicago, Ill., February 7-9, 1945.**

**National Crushed Stone Association, Annual Convention, Hotel New Yorker, New York, N. Y., January 29-31, 1945.**

**National Ready Mixed Concrete Association, Annual Meeting, Hotel New Yorker, New York, N. Y., January 24-26, 1945.**

**National Sand and Gravel Association, Annual Meeting, Hotel New Yorker, New York, N. Y., January 23-25, 1945.**

**Oklahoma Mineral Industries Conference, Annual Meeting, Oklahoma Club, Oklahoma City, Okla., December 5, 1944.**

## Cease Making Lime

LEHIGH PORTLAND CEMENT CO. has announced that manufacture of lime at its Buffalo, N. Y., plant will cease on or before December 15 unless the government requires the company to continue lime manufacturing operations. One kiln is now producing 250 tons of chemical lime daily for the Electro-Metallurgical Co. The city of Buffalo has sought a permanent injunction against the company for the creation of a "dust nuisance," according to the local newspaper report, but the city has agreed to postpone action in view of the announcement of the company.

## Penn. Taking More Lime

CLYDE A. ZEHNER, chairman of the Pennsylvania Agricultural Adjustment Agency, reports that superphosphate will be available to farmers in the State in only limited quantities. Some 70,000 of 90,000 tons ordered by farmers have been delivered, the balance of the superphosphate orders being cancelled. Munition demands have absorbed large quantities of sulphuric acid which is used in the manufacture of superphosphate. However, producers of agricultural limestone and lime are operating at full capacity to take over the additional burden. It is expected that 1,000,000 tons of agricultural liming materials will be used by Pennsylvania farmers this year.

## New Block Concern

MATERIAL, INC., Bremerton, Wash., is the name of a new concrete products company which was recently incorporated for $250,000. According to a local news item, S. R. Dickey, Bremerton, one of the incorporators, has announced that the company will manufacture an extensive line of concrete products, including brick, tile and culvert pipe. Other incorporators are: Adolph Traxinger and L. C. Nelson, Bremerton; and J. M. MacLennan, Homer A. Spencer and T. H. Smith, all of Seattle, Wash.

## Start Agstone Operations

GARNETT CRUSHER CO., Garnett, Kans., has purchased five acres from the city of Girard, Kans., for the purpose of operating a quarry and agricultural limestone crushing plant to supply Crawford County farmers. Included in the transaction is an easement on the remaining three acres owned by the city which the company may use for storage and other purposes. The company also will furnish spreading equipment.

# Meeting a Connecticut Sand Specification

By NATHAN C. ROCKWOOD

IN RESPONSE to our suggestion that producers submit their problems, we have one as follows from New England:

"State of Connecticut specifications for concrete sand are as follows:

Passing ⅜-in. .....100 percent
Passing No. 4.....95 to 100 percent
Passing No. 50.....10 to 30 percent
Passing No. 100.....0 to 5 percent

"An average sample from the bank would run:

Passing ⅜-in. .....100 percent
Passing No. 4..... 98.5 percent
Passing No. 16..... 83 percent
Passing No. 50..... 12 percent
Passing No. 100..... 1 percent

"You will note that the regular bank run passes the State specifications. However, the tensile strength test is right on the border line, sometimes being slightly over 100 percent as compared with standard Ottawa sand but more often just under. Our experiment was conducted in the following manner:

"We put our regular washed sand through a No. 16 screen keeping only that which was retained on the screen. One part of this was added to seven parts of our regular run and the strength ratio jumped to 110 percent immediately both on the 7-day and 28-day tests.

"It is now proposed to put about 40 percent of the washed sand coming off the conveyor through a Deister vibrating screen (single deck No. 16), wash the finer sizes to another stockpile for plaster sand and have all retained on the screen drop into and mix with the balance of the regular run on the stockpile.

"We would appreciate your comments on this or any other method designed to obtain desired results."

Fig. 8 shows what this specification looks like plotted on the kind of a chart we have been using to make our analyses. It is obviously an odd kind of specification to meet because it gives no percentages on the intermediate sizes between No. 4 and No. 50 sieves. Evidently the specification writer attempts to make up for this by strength test requirements, and the improvement in test strengths caused by removing some of the minus 16-mesh material is merely confirmation of what the graph shows. The dotted line is the average sample of bank run and this clearly shows a belly or excess of sand in the minus 16-mesh plus 50-mesh sizes.

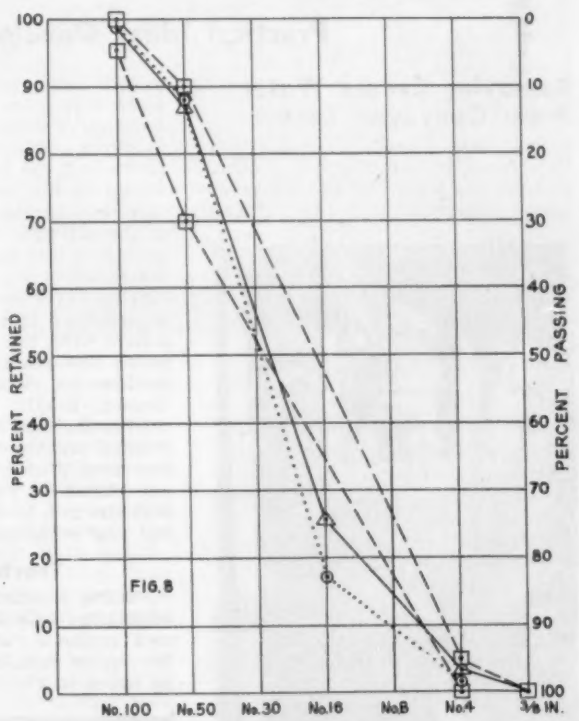



Fig. 8: Shows Connecticut specification plotted on chart in dash line. Dotted line is bank run analysis of raw material. Full line is corrected sand

Notwithstanding this excess of minus 16-mesh, there is very little margin in the minus 50-mesh and minus 100-mesh sizes. However, no intermediate sizes being specified, the bank sand actually does pass the letter of the specifications, which evidently were drawn merely to insure that all would pass ⅜-in. and to be sure of a minimum amount of minus 50-mesh and minus 100-mesh, depending on strength tests to show up the imperfection in percentages of intermediate or the belly sizes.

## Test Results

First we will see what the producer did to get his test sand which gave strengths of 110 percent of his bank-run material. He screened out the plus 16-mesh and added one part of this to seven parts of original material. Following the method of screen analysis described in the article in the October issue, we can make the following tabulations:

The size analysis of the original bank sand is as follows:

| | |
|---|---|
| Plus 4-mesh | 1.5 parts |
| 4- to 16-mesh | 15.5 parts |
| 16- to 50-mesh | 70.0 parts |
| 50- to 100-mesh | 12.0 parts |
| Minus 100-mesh | 1.0 parts |
| | 100.0 parts |

Seven-eighths of this sand would have the following analysis:

| | |
|---|---|
| Plus 4-mesh | 1.3 parts |
| 4- to 16-mesh | 13.6 parts |
| 16- to 50-mesh | 61.3 parts |
| 50- to 100-mesh | 10.5 parts |
| Minus 100-mesh | 0.9 parts |
| | 87.6 parts |

To this was added ⅛ of 87.6 parts or approximately 11 parts, all in the plus 4-mesh and 4- to 16-mesh sizes, in the proportions $\frac{1.3}{14.9}$ plus 4-mesh and $\frac{13.6}{14.9}$ in 4- to 16-mesh sizes. This is 1.0 part of plus 4-mesh and 10.0 parts of minus 4-mesh plus 16-mesh.

The resulting analysis would be as follows:

| | Parts | | Percent |
|---|---|---|---|
| Plus 4-mesh | 2.3 | = | 2.3 |
| 4- to 16-mesh | 23.6 | = | 24.0 |
| 16- to 50-mesh | 61.3 | = | 62.1 |
| 50- to 100-mesh | 10.5 | = | 10.7 |
| Minus 100-mesh | 10.5 | = | 0.9 |
| | 98.6 | = | 100.0 |

This is obviously a good concrete sand, and the increase of 10 percent in the strength tests is easily accounted for.

The producer naturally thought of duplicating what his test sand showed by simple processing to screen out

(Continued on page 140)

# HINTS *and* HELPS

## Practical Ideas Developed by Operating Men

### Removing Excess Water From Conveyor Tunnel

THE NEAL GRAVEL CO., Mattoon, Ill., formerly experienced trouble with excess water in the conveyor tunnel of its Covington, Ind., gravel

Pump installed in sump removes excess water in conveyor tunnel

plant. At times the tunnel filled up to a depth of 3 or 4 ft., seriously impeding production.

It was finally decided to install a centrifugal pump, with abrasion resistant water end parts, as the water contains considerable sand and gravel which drops from the conveyor belt. A 2-in. Amsco-Nagle type "SW," frame 10, vertical shaft pump operated by a float switch connected to a 3-hp. 1165 r.p.m. motor was installed in a sump. No trouble from excess water has been experienced since the installation of the pump.

### Welding Adds Life to Equipment

IN the accompanying illustrations may be seen how one rock products producer rejuvenates worn equipment by welding. This work is particularly valuable in these days of limited and frequently unobtainable supply parts for essential equipment. The applications of electric arc welding illustrated were reported to The Lincoln Electric Co., by Welder Bleckman of Washington, Mo.

#### Ball Mill Repair

Fig. 1 shows how a new bearing is applied to a worn ball mill journal. The shell of the bearing consists of a 1-in. thick steel ball, rolled in two halves and welded longitudinally, with a beveled butt joint. The build-up of weld metal is then cut off as shown. Original steel end castings of the mill are used, one of which is shown to the right in Fig. 1. This casting is riveted to the main part of the ball mill. The bearing is connected to this casting by the drilled plates which are welded to the end ring by three passes. This end ring is connected to the bearing shell by a fillet weld, not shown, which comprises five passes made with ¼-in. shielded arc electrode, A.W.S. specification, E-6012. The other side of the bearing shell is welded to another original casting of the mill with a four-pass fillet weld. This flange is not visible in Fig. 1. The bearing diameter is 2 ft. 10 in. wide, and the end ring or thrust flange is 1- x 2-in.

#### Tractor Axle

Finding it difficult to obtain a new maintainer axle for its tractor, this rock products company turned over the job of rebuilding to the welder. As noted in Fig. 2, the broken ends of the shaft were V-beveled, then welded and machined off. As the splines could not be machined, they were built up with weld metal over splines on the shaft and on the inside of the outer member. Three key-ways were then cut which held the two parts together to prevent rotation, one within the other. The axle is 34 in. long and 3½ in. in diameter at the broken section.

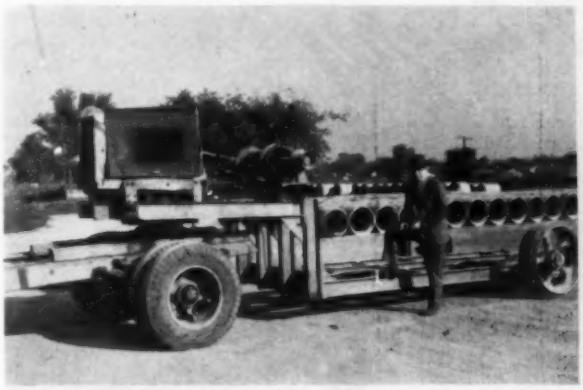
#### Bulldozer Frame

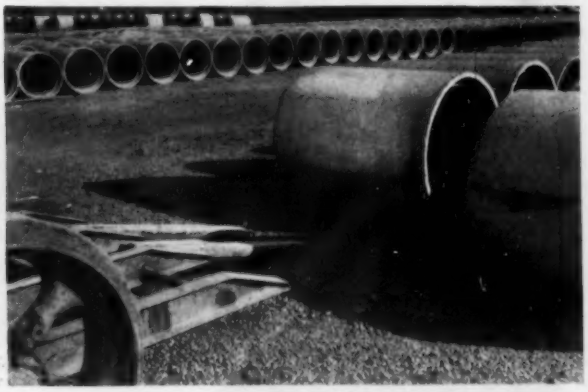
Fig. 3 shows how a broken side frame of a bulldozer was repaired by welding. The crack is beveled and welded. A splice plate is then welded on the side of the frame as shown. Welding is done in a flat position.

#### Hammermill Hammer

Instead of building up the worn top end of the hammer, such as the one shown in Fig. 4, the worn end was cut off with a torch and a piece of manganese steel, cut from another worn hammer, was welded on. This is welded crosswise to the arm to form a T with the correct amount of

Fig. 1: Machining operation on weld-repaired journal end of ball mill that had become worn. Fig. 2: Broken maintainer axle for tractor before restoring to usable condition by arc welding. Fig. 3: Welding a broken side frame of a bulldozer used in rock products plant operations. Fig. 4: Hammermill hammer, worn at the top, will be resurfaced good as new by building up with impact resisting electrode metal





Left: A. J. Bottiger of Sherman Concrete Pipe Co., standing alongside trailer which he designed for pipe haulage. Right: Rear end of trailer with wooden planks in place for loading pipe by means of winch driven by gasoline engine

head on the hammer. This is welded with an electrode for hard facing, the properties of which assure resistance to impact and abrasion.

## Protect Power Cable

By J. F. PRUYN

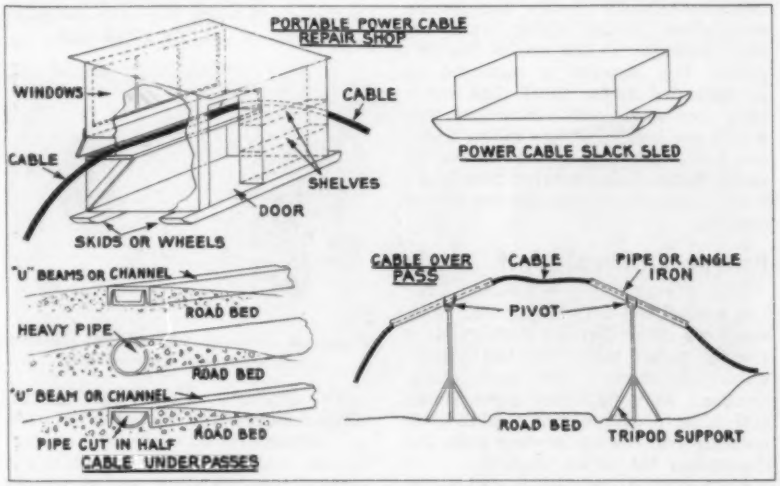
MAINTENANCE and replacement costs of power cables were prohibitive at a large electric shovel operation in the West. A study of the problem proved that the cable was being broken and worn out from the following causes: The large trucks were running over the cable; these cables were not buried at road crossings for it was thought that the shovel moved too fast to make the installation of the conventional cable road-crossings practicable. "Cats" and the shovels themselves were running over the cables, especially at night. Kinks in loosely scattered slack cable were jerked tight by the movement of the shovel. Cables left in water soon shorted out, especially near temporary splices. Loose slack snagged on rocks and resulted in tearing the cable apart.

To remedy these faults, the apparatus shown in the sketches were developed. A portable cable-repair shack was built for making permanent splices in the field. It was found that temporary splices made in the field soon shorted out. With this repair shack, the maintenance man has all his tools handy; he can braze and vulcanize the cable in any kind of weather.

Rapid means of crossing roads with cables had to be developed. The methods shown in the sketch were finally adopted for they could stand the beating and were easily installed. (Note "Underpasses" in sketch.)

Kinks in cables were almost eliminated by coiling excess cable on sleds. These sleds also saved the cable from being cut and abraded from dragging when the shovel moved to a new section of the quarry.

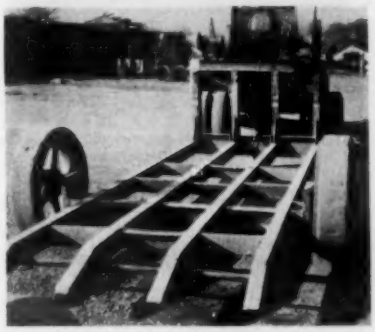
The most easily installed over-pass is shown in the sketch. It will be noted that arms of the support are pivoted which aids greatly in attaching the cable and swinging it up into position.




Illustrating various devices for the protection and repair of power cable. Three types of underpasses are shown to the left, below; pivoted overpass is shown to the right

## Pipe Hauling Trailer

SHERMAN CONCRETE PIPE CO., Nashville, Tenn., has devised a method of transporting concrete pipe from curing rooms to storage yard to eliminate any danger of chipping and damaging the pipe. Since equipment



Trailer chassis for hauling pipe. Note winch to pull pipe onto trailer

is at a premium during these days of priorities, this company fabricated its own trailer out of spare parts already on hand.

Four 15-ft. I-beams were used as the base of the trailer and were welded together with steel separators and spaced 2 ft. apart. The rear of the frame was mounted on solid rubber-tired wheels, allowing a 6-in. clearance off the ground. The frame was also constructed to slope slightly toward the rear. The front of the frame was constructed to fit on to the rear end of an old truck front of a semi-trailer truck. Mounted on this truck is a White winch, using ⅝-in. cable, which is used to pull the pipe onto the frame. A Chevrolet motor is used to power the winch.

When loading, the trailer is backed up to the pipe and the cable is thrown around the pipe and brought back to the front of the frame where it is fastened by a hook. The winch then pulls the pipe up onto the frame and rolls it in place. Six tons can be handled on this trailer.

# NEW Machinery

## Motor Starter

ALLIS - CHALMERS MANUFACTURING Co., Milwaukee, Wis., has designed a magnetic, reduced voltage cage motor starter which protects motors from sustained overloads, locked rotor condition, single-phasing and

Motor starter illustrated is a 200 hp., 440-volt, 3-phase, 60-cycle unit

overloading from too frequent starting.

This is accomplished with the type "ARC" starter with an accurately calibrated, thermal overload relay. It is available for control of motors from 5 to 2500 hp., up to 5000 volts, 3-phase, 50 or 60 cycles. Reduced voltage, two-point starting is obtained with a built-in auto-transformer, utilizing synchronous motor-driven, adjustable timing relay for transition from starting to running position. Interrupting capacity rating of the starter is ten times the motor's full load current. Units rated through 800 hp. have built-in auto-transformers; above 800 hp., auto-transformers are furnished for separate mounting.

## Vertical Slurry Pump

MORRIS MACHINE WORKS, Baldwinsville, N. Y., recently developed a vertical close-coupled slurry pump which is available in most of the standard sizes from 1½-in. Type S to 6-in. Type S. It is said that this type of pump will handle mixtures of abrasive solids and liquids equally as efficiently as the standard line of horizontal slurry pumps.

The Type S-VC pump, as it is called, has certain advantages over the horizontal unit, including: 1. Lower cost; 2. Occupies less than one-half floor space of horizontal unit; and 3; It is easy to dismantle. To remove the impeller and rotating assembly, it is withdrawn through the top of the pump casing merely by loosening and removing bolts. Motor and motor support are removed as a unit with the rotating element. The suction and discharge piping remain undisturbed. This design is very adaptable to pumps with moderately sized motors, say, up to 50 hp. Beyond that horsepower, the motors become rather unwieldy, and it is then advisable to use the horizontal slurry pump construction, according to the manufacturer.

This vertical pump has exactly the same hydraulic passages as are found in the company's regular line of horizontal pumps. The impeller is of

Slurry pump of vertical design requires only two bearings in the motor

pressure-balance design minimizing circulation of the solids from the shell passages to the eye of the impeller. The impeller is mounted on an extended motor shaft. The entire unit contains only two bearings which are located in the motor itself. On the other hand, the horizontal pump design has a total of four bearings, two in the pump and two in the motor.

## Power Control Unit

THE HYSTER CO., Portland, Ore., has announced a power control unit auxiliary drum for use with the D 4 towing winch made for the Caterpillar D4 tractor. This unit, while designed as a bulldozer power control unit, provides many additional hoisting and towing services with the Caterpillar D4 or R4 tractor.

Used with a tractor, it can serve as a topping boom on tractor crane unit; it can operate a pile driving hammer; serve as a haulback drum for double drum applications; for light scraper and dragline work; for cleaning ponds where line speed is

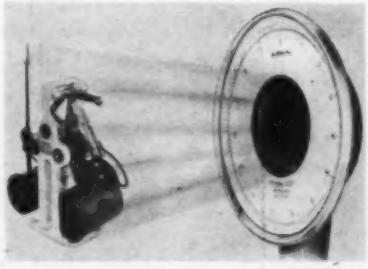
Tractor can be used for many purposes with power control unit auxiliary drum

more important than line pull; and to operate an elevator for building construction.

## Improve Scale Dial Mechanism

THE YALE & TOWNE MANUFACTURING Co., Kron Scale Division, Philadelphia, Penn., has announced an improved Kron scale dial mechanism. This mechanism is ball-bearing, springless, double-pendulum type.

Featuring specially designed ball bearings to eliminate wear at bearing points, the gear sector and shafts carrying the indicator and pendulum arm weights are all mounted in fixed centers. This is said to assure perfect alignment at all times and prevents these parts from being unseated even when they are subjected to shocks or jarring vibrations.



Scale dial mechanism built to assure accuracy where vibration is encountered

Friction and wear of the dial indicator shaft and sector gear teeth are minimized through an auxiliary sector which absorbs backlash. A special non-vibrating sector can be incorporated in the mechanism to practically eliminate the effect of

any outside vibration. Shocks and variations of temperature are completely compensated for by an adjustable non-leakable oil dashpot.

## Water-Proof Bags

BEMIS BROTHERS BAG CO., St. Louis, Mo., has developed a waterproof bag which has extreme resistance to moisture-vapor penetration, and a type of waterproof closure for it which is known as the "Aquatex Closure." This development is a direct outgrowth of efforts by the armed services to obtain a container which would withstand the very difficult conditions encountered in handling supplies.

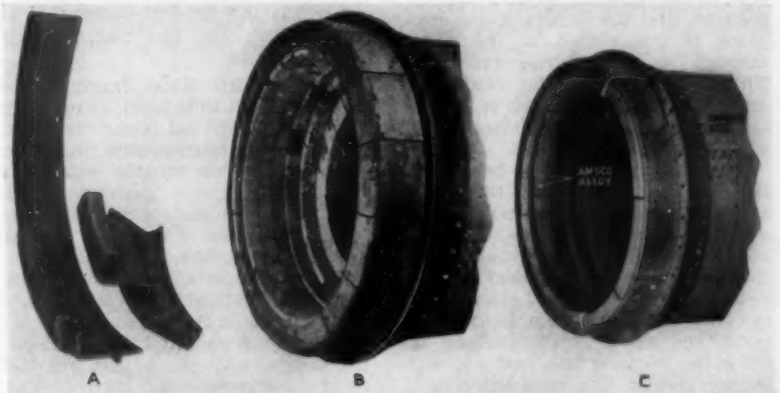
This waterproof closure consists of a tape made of starched crinoline laminated to double-napped flannel. The tape is sewn on the bottom of the bag when it is manufactured and then dipped in a special wax. The wax penetrates the crinoline and is absorbed by the flannel and the sewing thread. It is thus diffused between the plies of paper in the bag forming a ply-by-ply waterproof closure. The same method is used to close the top of the bag after it has been filled at the user's plant. These bags have stood the test of actual service.

## Segmental Shield for Segmented Kiln Ends

AMERICAN MANGANESE STEEL DIVISION, American Brake Shoe Co., Chicago Heights, Ill., has devised a segmental shield which fits over the nose ring segments on rotary kilns. This patented shield aids in keeping nose ring segments at lower operating temperatures. The inner segments are thereby kept at a temperature low enough to withstand the thrusts of the brick work. The segmental shield may also be removed without entirely cooling down. A further advantage claimed for this design is that the retaining bolts of the shield have been moved back to a point where they are less affected by the heat.

In the particular kiln end design illustrated, the nose ring or inner segments are bolted to the kiln shell and space has been left between each piece to permit it to expand independently without enlarging the diameter. The bricked-in kiln end is shown (B) with only the segmental shield; the partly shielded kiln end may be seen in illustration (C).

Made of Amsco Alloy, a high temperature metal, the segments do not "grow" like iron and steel, and there is said to be no scaling under normal conditions.




Segmental shield for kiln ends: (A) showing how shield fits over nose ring segments; (B) bricked-in kiln end with only segmental shield showing; and (C) partly shielded kiln end

Diesel-powered dredge built for the armed services has prefabricated steel hull

## Hydraulic Dredge

AMERICAN STEEL DREDGE COMPANY, INC., Fort Wayne, Ind., has announced that a number of 12-in. hydraulic dredges are being produced for the U. S. Army Engineer Corps. The Diesel-powered dredges have a compact design and are fully equipped to operate in isolated locations for long periods. They require no supply service except for fuel oil, lubricating oil and sustenance for personnel. They are designed to handle sand, clay and silt to a depth of 16 ft., and deliver the material through a maximum of 1000 ft. of discharge line at water level, or 500 ft. of discharge line at 30-ft. elevation.

Specifications call for a main dredge pump with a 14-in. suction and a 12-in. discharge pipe, powered by an eight-cylinder, 320-hp. Diesel engine; a main power plant of an 85-kw. Diesel-electric generator set, and an auxiliary Diesel power plant of 6-kw.

The prefabricated steel hull is an adaptation of the K-D bolted sectional barge that the company has been producing for the Army Transportation Corps for more than a year. The bolted steel hull enables shipment of the complete dredge, on standard railroad cars and as hold cargo to overseas destinations.

The dredge has a 36-ft. digging ladder provided with an adequate margin of overload capacity, and it is fitted with interchangeable cutter heads. It is equipped with a five-drum hoist which enables high rope pull at low speeds due to special compound gearing. Cone friction clutches are used and a drum switch controlling the hoist makes its operation extremely flexible.

## Lightweight Aggregate

THE MARITIME COMMISSION has developed a new lightweight aggregate composed principally of bentonite. It will be used principally for concrete ships and barges. Another lightweight aggregate is composed of pulverized slate mixed with organic matter and a binder. It is pelletized or briquetted and bloated in rotary kilns. The burning out of the organic matter produces a very lightweight material. Perlite, a volcanic glass containing a large percentage of combined water, is heated and caused to explode like popcorn, producing a cellular mass six to seven times its original volume.

## Abolish Mica Division

THE WAR PRODUCTION BOARD has announced that its Mica-Graphite division will be abolished December 2 and the unit's functions taken over by the Miscellaneous Minerals Division.

Typical walking dragline with long boom used in excavating phosphate muck

# Phosphate Production Problems

By OTTO H. WUSTRACK

**Second of series of articles covers mining and transportation methods in Tennessee. Typical dragline operations and innovations in mining and hauling procedure are discussed**

WITH TWO EXCEPTIONS all of the large scale mining is centered around the dragline, and the transportation around the narrow gauge steam railroad. One exception is found in the mining method practiced by the T.V.A. at the Columbia plant in which stripping only is done with draglines, but the muck is mined hydraulically. The other exception lies in the transportation method employed by Monsanto Chemical Co. in which special oversize trucks are used for muck haulage from mine to washer.

## Types of Draglines

Draglines have been standard for many years because they are so well adapted to loading below the level of the machine and at the same time allow the operator to see what goes into the bucket as it fills. Early machines were steam driven and carried ¾-cu. yd. to 1¼-cu. yd. buckets on 35- to 50-ft. booms. They lacked mobility, for the walking dragline mechanism and caterpillar had not yet been developed, so whenever it was necessary to move, the entire machine was inched along on numerous wooden rollers which in turn bore on skids, the operation requiring a crew of hands to manipulate skids and rollers from back to front as progress was made. It was not uncommon to spend half a day moving the same distance that a walker-equipped machine would cover in a fraction of an hour. The old steamers piped their water supply from the plant, involving miles of exposed pipe to be maintained which caused no end of annoyance especially in winter. The first great improvement was the introduction of the walker as an integral part of the machine and powered by the main engine. It has stood the test of time well and is to be found on the latest model Diesel and electric machines.

The walker consists of two large steel gondolas suspended on opposite sides of the center of the cab and large enough in bearing area to carry the full weight of the engines without "bogging down" in soft earth. They are operated by a pair of cams on a shaft which is connected to the main engine by means of a clutch controlled from the operator's platform. When the machine is mining, the gondolas are clear of the ground, that is the cams are at their highest position, and the weight of the machine is transmitted to the earth through its large circle rail base. This position puts the center of gravity at its lowest which is advantageous when digging in heavy soil with extended boom.

When the dragline is to be moved, the clutch to cam shaft is thrown in and the gondolas are brought forward and downward to bear on the ground while further revolution of the cams lifts the base clear, as the weight of the machine is transferred to the gondolas. Completing the cycle, the cams rotate further to bring the machine base again to rest on the ground. The cam throw is 5 to 6 ft. and the cycle rate less than ¼ minute. By this method of weight transfer the machine is "placed" rather than rolled into position, and on surfaces which always bear with their full areas in spite of irregularities on opposite sides of the dragline. This principle has made the walker a favorite for the heaviest draglines. There are few moving parts and all of these are rugged and simple, minimizing the use of specially skilled repair labor.

The first development in non-steam was that of the semi-Diesel or hot-head vertical engine with two to four cylinders. It packed more power, eliminated water line and packing troubles, simplified the fuel supply problem, and performed with greater efficiency than the steam engine, but because of its inherent characteristics was difficult to start in cold weather. The bulkiness of the cylinders, the necessity for rebabbitting the huge crankshaft bearings in the field and the large labor cost of dismantling such heavy machinery for ore hauling, made the recent introduction of the full Diesel a timely one. The modern dragline Diesel is a compact, high speed, power plant of which the 100-hp. Caterpillar D 13000, with 135 hp. maximum, is representative.

Many of the latest draglines are equipped with wide track caterpillars for moving. The cat is very fast and has more maneuverability than the walker but has trouble with soft ground as it has a tendency to dig in and hence mats are frequently used in the worst spots to prevent bogging down. The numerous sliding and rolling parts which constitute the track mechanism call for a closer maintenance check than that required on the walking type. The bearing area at all times is that supplied by the tracks only and the center of gravity is considerably higher off the ground on caterpillar-equipped machines than on walker machines.

The tendency has also been to longer booms and larger buckets, typical specifications being as follows: Bucyrus-Monighan walker dragline with 85-ft. boom furnished with a 2½-cu. yd. Page automatic bucket, powered by 100-hp. Diesel engine, equipped with hydraulic drum controls. Other dragline makes in the territory are Marion, P & H, and Koehring while Blaw-Knox and Page are representative of buckets. Larger buckets and longer booms make it possible to dig wider pits faster which in turn entails less track shifting and hence less labor per ton. In an area of spotty deposits and saddles where frequent and rapid movement is desirable and where a large bucket would have difficulties, the small draglines are more economical.

### Mining Procedure

One of two procedures is followed in mining a given tract; either a pit is stripped of its overburden the entire length of the field and then mined before the next adjacent pit is stripped, or a short length of pit within the radius of reach of the boom is stripped and mined successively before the machine moves on up the field another radius length to repeat the operation. In both methods care is taken to remove all of the lump and muck from one pit before the next adjacent one is started in order to preclude the possibility of covering up "pay dirt" with overburden from the new pit. The width of each pit varies from 40 to 100 ft. depending largely on the length of the boom but it also depends upon the depth of the overburden and, to compensate for progressive deepening of the latter, the dragline operator must sometimes narrow down the pit from its beginning width in order to dispose of the overburden far enough beyond the remote edge of the freshly uncovered phosphate so that it remains exposed.

In a plant which mines several widely separated areas simultaneously the first method is preferred. While one pit in one area is being stripped another pit in the other is being mined. This serves to minimize transportation tie-ups at the first pit and permits loading at the other as fast as the dragline can dig. The second method is better on deposits with light overburden concomitant with long hauls. The latter invite transportation time table upsets which in turn would cause idleness of the dragline if it were in position for digging and loading phosphate only, which would be the situation at a pit entirely stripped; whereas a train delay to a pit only partially prepared simply means that the dragline removes additional overburden until the arrival of empty tram cars.

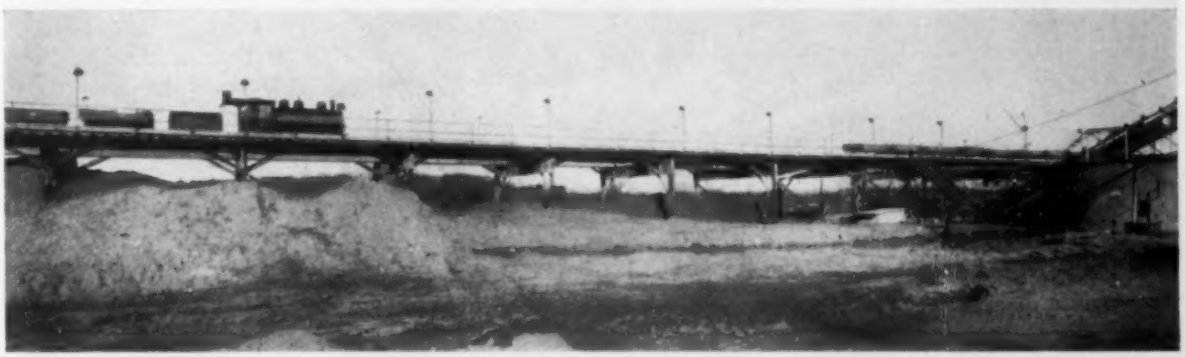
Another method of reducing idling of the dragline due to unforeseen transportation difficulties is to make use of a mechanical car spotter at the point of loading. Ten to twelve empty tram cars are always left at the pit which are spotted and loaded between train arrivals from the washing plant. As often as not a full train of trams is ready by the time a locomotive pulls up and all it has to do is uncouple from the empties and haul full trams back, saving the time it would otherwise spend in spotting cars. The car spotter has the further advantage of neutralizing delays caused by the peculiarities of producing at the pit. As an example, a freshly exposed bed of phosphate may be estimated to yield 100 4-cu. yd. trams of muck, but after 40 trams have been loaded, loose limestone slabs are encountered which must be removed before the balance of the muck can be loaded. The removal may require an hour or it may consume a half day, but whichever it is the waiting train is sent back to the plant to wait there to be signalled to return. Since the delay at the pit is indefinite the locomotive may be busy on another task when it receives the signal to return. The delay at the dragline with no cars available for loading could then be considerable. On the other hand, with a spotter at hand it is of little moment whether the limestone removal was guessed at as requiring one hour when four were consumed, or vice versa, for empty cars will be ready.

### Selection of Muck

An experienced dragline operator is a key man in the profitable production of phosphate rock, for careful selection of muck at the pit reduces directly the cost of washing which is the largest unit operation expense with the exception of grinding; in other words selective mining is the prime factor in the production economy. If the operator digs too deep as his bucket bottoms out he may lower the grade and materially reduce the rate of production through the washing plant; or if he skims too much he may leave valuable muck behind. Whatever selection is made at the mine eliminates that much picking labor ahead of the washer feed grizzley and on the picking belts within the washer system. Segregation into two washed grades begins at the mine where the separate grades selected on appearance, are dumped into separate trams, which are later segregated at the plant to be discharged into the respective stockpiles. To make the selection on the appearance of the muck requires an expert knowledge of the physical properties of phosphate, in the mass, which is only acquired on long contact with it. Phosphate colored gravel, and sandstone fool the best of the rule and thumb experts at times, and therefore a chemical analysis of a pit sample is always desirable when a doubtful situation involving more than a few tram loads comes up.

A dragline is sometimes "up against it" when phosphate deposits are encountered in deep, narrow cutters. Even if a small bucket will clear the limestone sides it is very likely to be ineffectual because of hindrance to its loading, by protuberances of bed rock. Since cutters often produce the richest rock of the tract it is highly desirable to clean them up, so pick and shovel are resorted to and the rock pitched out where it can be loaded by the dragline. Hand labor,

*(Continued on page 109)*



Steam locomotive and special mine cars hauling phosphate rock to one of the Tennessee phosphate plants

*Industrial Sand*

# Step Up Silica Production

By BROR NORDBERG

General view of plant. Screening unit stands 150 ft. high. To the left is the old wash mill, and immediately to the right of screening unit is the drainage and drying plant. Steam power plant and stack may be seen to the right

**Wedron Silica Co. adds new stripping equipment, improves washing facilities, and increases overall mill capacity**

MOST PRODUCERS of high silica industrial sands have had to step up their production facilities during the past few years to keep pace with the demands made upon them by war industries. The industrial sand industry has done a commendable job in meeting unprecedented calls for a variety of silica products, some of which have taken the place of normal commercial production for non-war use.

The Wedron Silica Co., Wedron, Ill., will serve as a good example of a concern that has expanded its capital investment for greater production during the past years. These expansions will be discussed herein but we also will point out other ways in which capacity and efficiency of the overall operation at Wedron had been increased every year since 1934. These developments have to do with stripping, the recovery of fines previously lost in the washing process, the increase of drying capacity, improvements in drain bin technique, etc.

At the time of Pearl Harbor, the Wedron plant had a capacity of 1000 tons of processed silica including approximately 175 tons of silica flour for a 24-hr. run. Present capacity is 1800 tons, including 250 tons of silica flour. Ordinarily, 60 percent of the total production is for glass manufacture, but through the war period, over 90 percent of the output has gone into war manufacturing industries.

Such an expansion in capacity affected all the stages in operation from stripping and excavation through to the loading of the finished products into railroad cars, including the washing, drainage, drying, screening and packing operations.

The deposit under excavation is St. Peter sandstone from the same ledge that outcrops in nearby Ottawa and which is famous the world over for the high grade of its silica. Finished products run up to +99.8 percent $SiO_2$ in purity. A 100- to 115-ft. face is under excavation, which must be blasted down preparatory to hydraulic mining with high pressure monitors, and pumping to the plant

Overall view of excavation. Note 40-ft. overburden over silica. Steam pulsometers are employed to convey silica pulp to central pumping station for delivery to main plant. Hydraulic monitors wash down silica to intake of each pulsometer

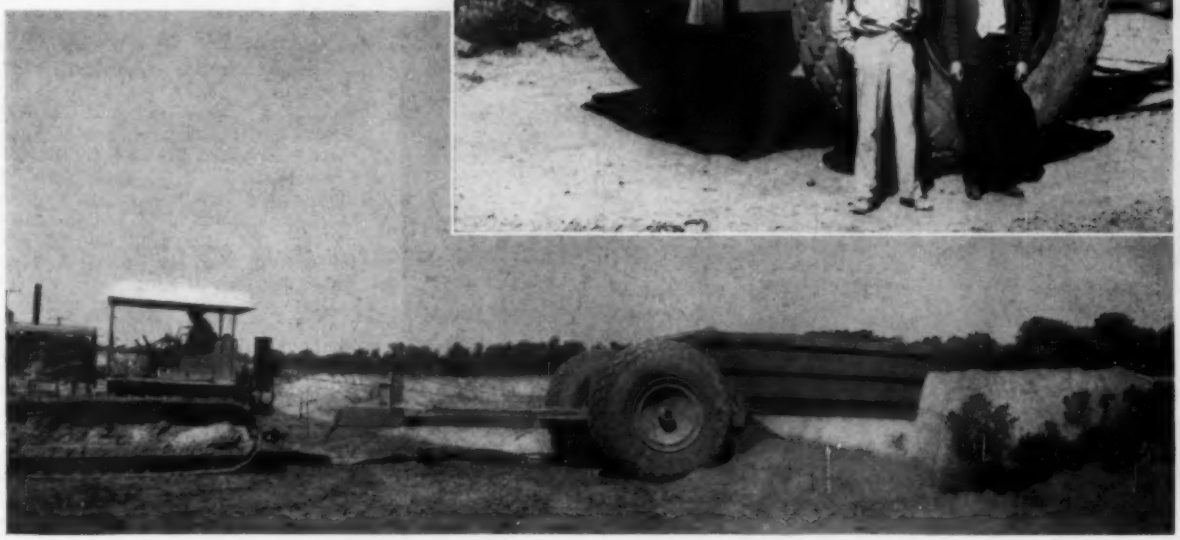
Stripping silica deposit. Shovel loads 30-cu. yd. pneumatic-tired buggy which is pulled by tractor to worked-out section of pit where it is dumped

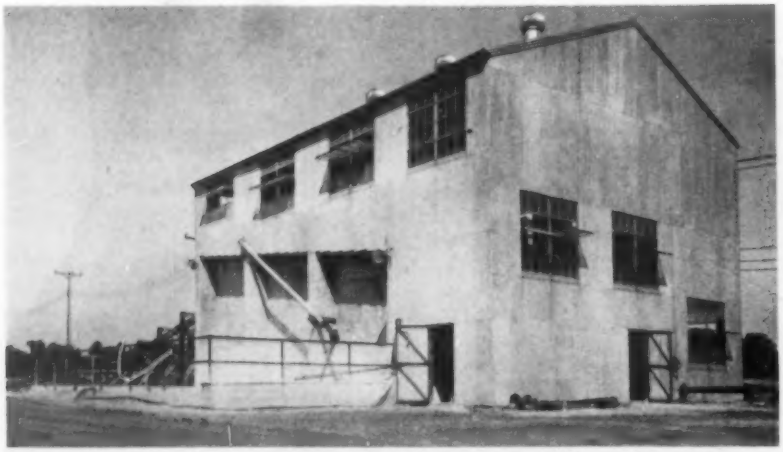
wash bins by steam-driven pulsometers. Hydraulicking breaks the sandstone down into its separate grains, with the aid of some block shooting at the working face. Water for mining and washing operations accumulates as seepage. Capacity of the mining operation has been increased to conform with mill requirements by the simple process of adding more branch feeder lines in the mine. Five or six feeder lines are in service to deliver 1800 tons of silica per day to the wash mill through a pipeline carrying 30 percent solids.

At Wedron, the deposit is covered with 40-ft. of overburden, which necessitates the handling of tremendous tonnages of clayey material in order to keep ahead of mining operations. This phase of the operation has come in for considerable study during the past few years and the company has finally settled on large capacity rubber-tired earth-moving equipment to do the job. Capacity for earth removal has been increased 50

To the right: John A. Dummett, superintendent, right, and Fred Hanna, assistant superintendent, standing alongside tire of 30-cu. yd. buggy used for hauling strippings to dump

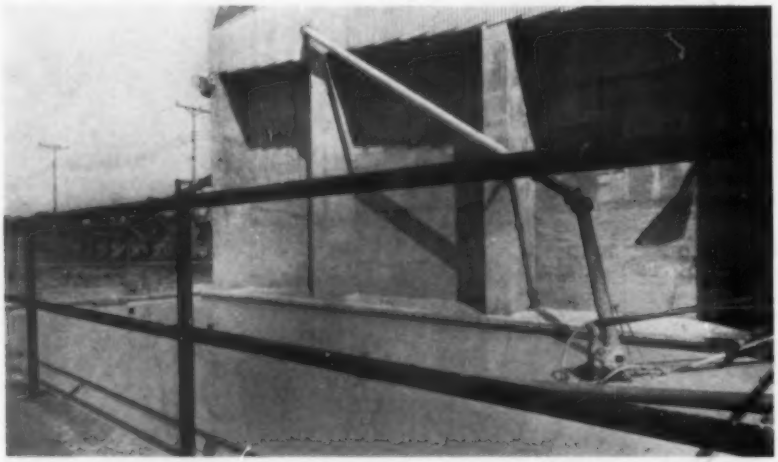
Below: Dumping load of stripped material from 30-cu. yd. buggy. Note how body has moved back over pit





New wash mill has double capacity of old installation. On left is concrete settling pond for recovery of sand fines settled from overflow of wash bins inside

Interior of new wash mill showing two 300-ton drain bins, looking toward discharge end; one is being drawn from while the other is being filled



Close-up of settling tank alongside wash mill. Overflow from drain bins inside enters tank, fines settle out, and water overflows to sewer. Baffles slow water velocity. Recovered sand is pumped by steam pulsometer, right, back to drain bins

percent by two successive changes, from the use of locomotives and cars years ago and, later, side-dump crawler-mounted earth-movers to the rubber-tired earth-movers now in service. Maintenance was an important factor in converting to rubber-tired equipment.

There are two haulage units, each consisting of a RD8 Caterpillar Diesel tractor and a 30-cu. yd. LeTourneau Buggy traveling on Firestone 28-ply heavy-duty size 30.00-40 tires which actually measure 8 ft. 4 in. outside diameter. One unit can move sufficient overburden to keep ahead of the mining, by operating continuously on a 12-hr. daily schedule on a year-around basis in the removal of 1600 cu. yd. per day. It requires 15 minutes for a unit to be loaded, hauled 1500 ft. to the dump, which is a worked out area, and be returned for another load.

Loading is accomplished by a 1½-cu. yd. Link-Belt Speeder Diesel shovel and the overburden, which is largely of heavy clay hardpan, is blasted to increase the shovel loading efficiency. Three or four 5-in. well drill holes, five or six feet part with a 20-ft. burden are blasted simultaneously, to dislodge and bring down the face.

The buggies have a sliding dump mechanism operated by a power take-off from the tractor. One unit has been in continuous service three years and the other for two, but the maintenance expense has been negligible. No difficulty has been experienced with bogging down of the equipment during rainy weather, in fact, the weight of the loaded units is effective in compacting the roadways.

Four men handle the entire stripping operation, including cleanup work on top of the sandstone ledge and in the disposal of overburden which are accomplished by an RD-6 Caterpillar tractor with a LaPlant-Choate bulldozer.

## Washing Operations

The silica grains are cemented into a sandstone by a magnesium clay binder, which is removed through washing with large volumes of water —long standard practice in the Ottawa district. New wash bins of double the original capacity were built to accommodate the increased delivery from the mine and for application of a greater volume of clear water per unit of sand handled. The entire wash mill is a new one, with two reinforced concrete bins that hold 300 tons of sand each. Incoming mine run sand enters a distributing box and may be diverted into either bin. While one is being filled, sand is being drawn from the other for delivery to the drain bins in the main plant. These wash bins are interesting, for they really are enormous rising current classifiers. They slope

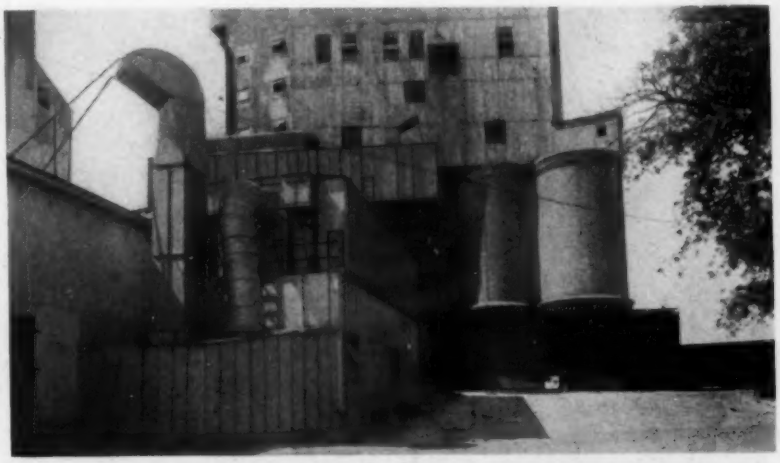
toward the sand drawoff end, and have a horizontal network of 5-in. pipelines covering the bottom of each, through which clear water is introduced vertically into the settling sand at 100 p.s.i. pressure through regularly spaced perforations. The object is to agitate the material as it settles so that a maximum of clay particles will rise to the top of the bin, where it is floated off.

When a wash bin fills up, the sand is withdrawn by opening a dam into a feed box for an 8-in. Allen-Sherman-Hoff Hydroseal rubber-lined pump for transport to the main plant drain bins. Hydraulic monitors facilitate the movement of the sand to the drawoff point. This pump handles 40 percent solids and is lined with synthetic rubber which compares favorably with natural rubber in withstanding abrasion, according to the superintendent.

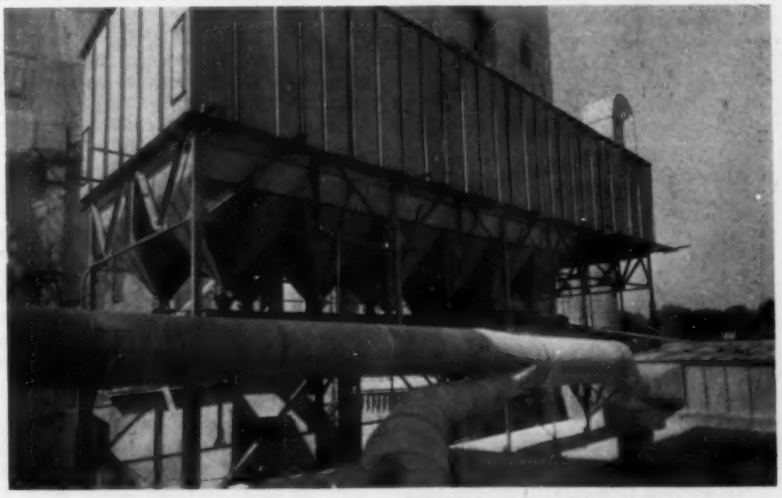
The problem is to float off clay impurities without too much sacrifice of fine silica grains. In the old wash bins, the overflow went to waste into the Fox river nearby, and considerable of the sand grains in the 100-mesh size range necessarily were lost.

In connection with the new wash mill, a concrete settling basin 10 ft. deep, measuring approximately 16- x 45-ft., has been built to receive the overflow from the drain bins in order to trap more fines. This basin is in closed circuit in the sense that it slopes toward one end where a steam pulsometer of the kind used in the mine pumps settlings back into the wash bins at intervals when the basin fills up. There are two submerged weirs, to still the flow of water, with gates at the bottom of each, so the sand may be washed, at intervals, by hydraulic monitors to the low end of the basin where the pulsometer is located. Overflow water drains off into the river. It is estimated that 75 percent of the fines in the size range recovered, which were lost in the previous operation, is recovered in the settling basin.

Drain bin capacity is 2400 tons, the same as it was in volume before the war, but actually, through improvements in drainage efficiency, silica can be conditioned for drying in a shorter period of time. For many years the silica has been drained, after washing, over a gravel filtration bed in the bottom of the drain bins and the drained water wasted. Draining to 3 or 4 percent moisture before drying the silica would be the ideal under normal conditions but, it has often been necessary to rehandle the silica into the dryers under high production schedules after short draining periods. Under these conditions, with a filter bed of coarse gravel, the crane operator often would encounter three or four feet of water near the bottom of the



**Center, foreground, is the dust collector serving grinding plant. Above and to the rear is collector for screening plant**



**Close-up of dust collector for sand screening plant. Dust is wasted**

**Interior of dust collector for grinding plant, showing ruppers**

One of four 6x22 ft. tube mills for grinding silica flour

Rubber-lined pump (8-in.) for delivery of silica pulp from wash mill to drain bins

drain bins, in rehandling after a one-day drain period.

To correct this condition, the bins now have an 18-in. layer of ½-in. round river gravel for a filtering bed with 4-in. drain tile submerged in the gravel, in parallel rows spaced about 5 ft. apart cross-wise to the long axis of the drain bins. The tile extend through the building sidewall and the water flows into a catch basin outside which overflows clear water to the river. A steam pulsometer re-handles the settlings into the drain bins to recover silica fines which necessarily escape through the drain tile. The gravel filtering bed is protected by rails and sectional flooring, from damage by the crane bucket in handling the silica into the dryers, and will not foul appreciably during an entire year of continuous service. Maximum moisture retained after a one day drain period will not exceed 8 percent, since drain tile were installed.

After draining off excess moisture, the silica must be completely dried for screening over electric vibrating screens. Drying is accomplished through steam coil dryers, standard practice in the Ottawa district for many years, and the steam for drying is developed by three 285-hp. steam boilers. New coils have been added to each of the four dryers to increase their capacity. A dryer consists of a bin over the coils, into which sand is fed by a traveling crane. As the sand dries it works its way down between the coils to a belt conveyor, extending under all the dryers, for transfer to a bucket elevator to the screening plant. Temperature of the silica as it falls on the belt is approximately 200 deg. F.

## Dry Screening

The screening plant has been rebuilt over existing bins, and is an impressive steel structure reaching 150 ft. above ground level. It is a 100 percent gravity plant with three batteries of 16 No. 16 Tyler Hum-mer totally-enclosed 3- x 5-ft. screens on three separate levels. Total screening surface area had been increased by 25 percent in rebuilding for greater capacity. In addition to these screens there is a 3- x 10-ft. scalper of the same type to receive the incoming silica from the dryers, and several other 3- x 5's are in service for special sizing and scalping in other parts of the plant.

Six distinct grades of silica are normally screened, ranging from a grade minus 100-mesh up to 30-mesh and 40-mesh grades for glass manufacture and sand blasting application. Sand grains from the mine bulk around 40- to 50-mesh. However, the plant is designed for blending by re-combination of various grades from the plant bins on belt conveyors when loading silica for shipment. Bin capacity is approximately 2500 tons of graded sand. Rubber-lined enclosed wooden chutes convey the various grades from the screens into the bins.

## Silica Flour

Wedron Silica Co. is one of the country's largest producers of silica flour. Capacity of the grinding mill, adjoining the screening plant, has been increased to approximately 250 tons of product in 24 hr. with the addition of a new 6- x 22-ft. Allis-Chalmers tube mill. There are now four identical mills. Silica flour is ground into 200-mesh products in open circuit and to 325-mesh with the mills in closed circuit with a 14-ft. Raymond double-whizzer mechanical air separator.

Silica grains in the glass sand size range, about 40-mesh, comprise the feed for the grinding plant. A belt conveyor carries this product from

*(Continued on page 138)*

Battery of vibrating screens. There are 48 on three levels

# Industrial Sand Directors Discuss Problems

**Research, car supply, silicosis legislation, foundry sand tests, labor supply, and manpower control were subjects of discussion**

T. C. Matthews, president, National Industrial Sand Association

WITH T. C. MATTHEWS, president, presiding, the board of directors of the National Industrial Sand Association met in Chicago, November 17, for its annual interim session. In addition to usual business features of finance, membership dues, research, etc., the agenda included discussion of freight rates, car supply, silicosis legislation, tests of foundry sand, U. S. Bureau of Mines reports on industrial sand statistics, labor supply and manpower controls, priorities for new equipment, repair parts, trucks and tires. The date and place of the next annual meeting of the association was announced as May 24 and 25, at the Homestead Hotel, Hot Springs, Va., where a number of recent annual meetings have been held.

### Silicosis Legislation

T. C. WATERS, the association's legal advisor, reviewed developments in the fields of treatment of silicosis and recent changes in state laws in relation to workmen's compensation as related to silicosis cases. Among the issues that are arising Mr. Waters mentioned a proposal being advanced by the C.I.O., that medical examinations of employes be regularly conducted and the employe furnished with a copy of the employer's physician's report. The C.I.O. proposes that the employe's physical condition must not be made a condition of employment unless he has a communicable disease; that the employe shall have the right to consult his own physician and shall not be laid off, in case of difference of diagnosis, without agreement by a specialist. This proposal is particularly unsuited to deal with a case of silicosis where continued employment of the victim could only result in worsening his physical condition.

As yet the industrial sand industry has not been able to obtain reduced rates on workmen's compensation insurance from the stock companies. Members of the National Conference committee which sets the rates are sympathetic, but the fear that a possible depression in industry may greatly increase the number of claims deters the lowering of rates, although the committee has set up a new formula for rate-making, which may help. At present the rates for the industrial sand industry are much higher than experience justifies.

As to changes in workmen's compensation laws, Mr. Waters confined his remarks mostly to suggested revisions in the West Virginia law made by the state administrator of the law. The chief change would eliminate silicosis cases as now dealt with in a separate fund and place them under the general personal injury clauses. Another proposed change is to set up three different stages of injury and separate amounts of compensation for each: (1) $500 presently payable if the employe continues; (2) $500 to $1600 for more serious injury; (3) full compensation for life in cases of permanent incapacity to work, or total disability. It is also proposed to extend the time in which a claim for total disability must be made from 1 year of date of death to 6 years of the date the administrator determined the employe to be in the third stage of disability. A proposed change would also extend the time for filing claims from the present 6 months to 1 year.

### Car Supply and Freight Rates

It was reported that while the box car situation is pretty tight at the moment because of crop movement, the situation is nearing the season when ordinarily there is some slack. The railway managements believe they will be able to take care of all the industry's requirements. The open-top car situation is also tight, but it is believed peak loading of coal has been passed. In two words, the railway managements are "cautiously optimistic."

The freight rate situation has not changed. The association has been on record since 1942 in the current Ex-parte 148 case; the position taken is that the industry recognizes the possible general need for increasing all freight rates but opposes percentage increases on industrial sand because it would disturb existing competitive relationships.

### Tests of Foundry Sand

STANTON WALKER, consulting engineer for the association, and C. MATHIESEN, chairman of the special advisory committee, reported on strength tests for bonded molding sands. Mr. Mathiesen doubted that strength tests could be depended upon because of the effect of clay content on a particular sand. Moreover, under American Foundrymen's Association specifications, everything under 20-micron size is classified as clay. The strength tests of various foundries on the same material seldom come out alike. The test is so sensitive that it is affected by the temperature (viscosity) of the water used, differences in acidity, etc. Nevertheless, Mr. Mathiesen thought that the test answered the purpose of the foundrymen, even if it did not help the sand producer. He thought the committee should do some research work on the problem.

Mr. Walker said the real kernel of the problem was the procedures for specifying bonded sands. He also suggested that the annual meetings of the National Industrial Sand Association include one or more technical papers by members of the industry—that the time had come for establishing the association as an authoritative source of technical information on industrial sands.

Mr. Walker also discussed the proposal of the National Hygiene Foundation to publish a booklet on dust control in sand-blasting operations. It will probably have to be postponed until after the war. An advisory committee of the association will be appointed to take action.

### Bureau of Mines Reports

A. WARSAW, chairman of a special committee, reported on suggested changes in the Bureau of Mines schedule for reporting tonnages and average plant prices of industrial sands. The committee had suggestions for four different alternative classifications. It was decided to submit these to the entire membership for their reaction.

### War and Labor Problems

The rest of the session was devoted to a discussion of current problems by V. P. AHEARN, executive secretary of the association. Among other things he described how to go about getting a Certificate of Non-Necessity for income tax depletion write-off purposes; cleared up some misunderstanding in regard to renegotiation, and asked questions about producers' manpower problems.

Reporting around the table there did not appear to be any general complaint because of lack of coöperation from the Manpower Commission, but labor supply is short, especially in metropolitan areas. In agricultural sections producers are doing better in finding men. Absenteeism and diminishing efficiency are big problems. One producer is using Italian internes, but they are not the physical type to be of much help. Another tried women for clean up work, but found it didn't work out because the women diverted the men from their jobs.

### Labor Contracts

HAMILTON ALLPORT reported on the present W.L.B. case involving renewal of labor contracts in the Ottawa, Ill., district. The case has been before a tri-parte panel, and its report is now awaiting action by the regional W.L.B.

### Registration

George A. Thornton, Ottawa Silica Co., Ottawa, Ill.
John F. Putnam, The National Silica Co., Oregon, Ill.
W. Sherrath, South Jersey Sand Co., Philadelphia, Penn.
C. M. Hardy, Hougland & Hardy, Evansville, Ind.
E. T. Andrews, Pennsylvania Glass Sand Corp., Lewistown, Penn.
J. S. Cable, Minnesota Mining & Mfg. Co., Akron, Ohio.
Mrs. E. J. Hartmann, George W. Bryant Core Sands, McConnellsville, N. Y.
R. G. Hay, Ayers Mineral Co., Zanesville, Ohio.
P. G. Forman, Industrial Silica Corp., Youngstown, Ohio.
J. M. Strouss, Deckers Creek Sand Co., Morgantown, W. Va.
Sterling Farmer, Sand Products Corp., Cleveland, Ohio.
Harry F. Spier, New Jersey Pulverizing Co., New York, N. Y.
A. N. Farmer, Sand Products Corp., Cleveland, Ohio.
Clayton F. Devine, Silica Sand Traffic Association, Chicago, Ill.
Stanton Walker, National Industrial Sand Association, Washington, D. C.
E. O. Schneider, Ottawa Silica Co., Ottawa, Ill.
John D. Cronenweth, Great Lakes Foundry Sand Co., Detroit, Mich.
Jack Cleary, Sand Products Corp., Cleveland, Ohio.
W. J. Muhlitner, Great Lakes Foundry Sand Co., Detroit, Mich.
T. C. Matthews, Pennsylvania Glass Sand Corp., Lewistown, Penn.
Arthur B. Schlesinger, New Jersey Pulverizing Co., New York, N. Y.
A. Y. Gregory, Whitehead Bros. Co., New York, N. Y.
C. Franklin Wolf, New Jersey Silica Sand Co., Millville, N. J.
A. Warsaw, Wedron Silica Co., Chicago, Ill.
Dwight E. Manley, Manley Sand Co., Rockton, Ill.
T. C. Waters, National Industrial Sand Association, Baltimore, Md.
George F. Pettinos, Jr., George F. Pettinos, Inc., Philadelphia, Penn.
Lyle T. Manley, Manley Sand Co., Rockton, Ill.
P. W. Palmer, Browntown Silica Co., Browntown, Wis.
E. M. Durstine, Keener Sand & Clay Co., Columbus, Ohio.
Hamilton Allport, Standard Silica Corp., Chicago, Ill.
C. Mathiesen, Whitehead Bros., Albany, N. Y.
V. P. Ahearn, National Industrial Sand Association, Washington, D. C.
Stanley A. Phillips, Pit and Quarry, Chicago, Ill.
Bror Nordberg, Rock Products, Chicago, Ill.
N. C. Rockwood, Rock Products, Chicago, Ill.

## California Producers Meet with Highway Officials

CALIFORNIA producers played host to Stanton Walker, director of engineering of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, at an important luncheon and afternoon meeting on November 3rd, at Sacramento, Calif.

This meeting was well attended by representatives of the rock, sand and gravel producers of California, and the guests included many of the ranking highway and other officials of the state, as well as other distinguished members of the engineering profession from the Bureau of Public Roads, the United States Army Engineers, the United States Navy, and the municipalities.

It was called by ROBERT MITCHELL, president of the Consolidated Rock Products Co. of Los Angeles and also president of the National Sand and Gravel Association, who, after consultation with the producers of both Northern and Southern California, felt that the presence of Stanton Walker in California was the proper occasion for the beginning of an effort to standardize specifications for the sizing of aggregates throughout the state.

E. J. GOODPASTOR, general manager of Pacific Coast Aggregates, Inc., acted as chairman of the meeting and introduced Robert Mitchell who acted as Master of Ceremonies and introduced the speakers.

A splendid and encouraging address was made by C. H. PURCELL, director of public works of California, followed by a brief talk by G. T. McCOY, state highway engineer, on the problem in question. T. E. STANTON, laboratory engineer of the State Highway Department, expressed the desire of the Department to cooperate with other authorities on the question of Simplified Practice in the matter of aggregate specifications.

COL. ALEXANDER R. HERON, director of the State Reconstruction and Reemployment Commission, gave a very instructive talk on what was being done by the Commission to pave the way for an early start of reconstruction work.

Mr. Mitchell then introduced STANTON WALKER, whose talk on the seriousness of over-lapping specifications was listened to with great interest.

A general discussion followed Mr. Walker's address in which many questions were asked by the producers, following which F. M. Hveem, of the State Highway Laboratory, showed and explained slides made by his department on which the gradings of the State Highway specifications were shown realistically.

As a result of this important meeting, it was decided that committees of producers from both the northern and southern parts of the state should be formed to work jointly with committees of engineers from the various authorities.

A list of those attending the meeting is as follows:

Stanton Walker, Director of Engineering, National Sand & Gravel Association; C. H. Purcell, Director of Public Works, State of California; G. T. McCoy, State Highway Engineer; T. E. Stanton, California Division of Highways; Col. Alexander R. Heron, Director Reconstruction and Reemployment; Fred Grumm, Asst. State Highway Engineer; Richard H. Wilson, State Highway Dept.; F. M. Hveem, State Highway Laboratory; G. A. Tilton, Jr., M. H. Hubbs and I. O. Jahlstrom, Assistant Construction Engineers, State Division of Highways; T. H. Dennis, W. R. Looering, O. J. Porter, Earl Withycombe, J. M. Kane and R. M. Gillis, Division of Highways, State of California; D. J. Steele, United States Dept. of Public Roads; E. C. Brown, Public Roads Administration; D. C. Willett, Division of Architecture, State of California; C. B. Palmer, Laboratory Engineer, U. S. Engineer Dept., L. A.; Lt. Paul E. Evans, Laboratory Engineer, 11th Naval District, San Diego; Merrill Butler, Bureau of Engineering, City of Los Angeles; Stanley M. Hands, Bureau of Engineering, City of Oakland; Dwight F. Roberts, Smith-Emery Co., Los Angeles; E. J. Goodpastor, R. K. Humphries, Don B. Piper, R. L. Robinson, J. R. Cassidy, Donald Meek, Ed Howard, and G. F. Hampton, Pacific Coast Aggregates, Inc.; W. H. Taylor, John E. Porter, and Royal E. Fowle, Granite Rock Co.; E. F. Brovelli, A. G. Streblow, and Malcolm McIntyre, Basalt Rock Co.; Robert S. Barneyback, H. J. Kaiser Co.; Henry C. Steinbach, Blake Bros.; P. W. Schoeningh, Perkins Gravel Co., Sacramento; C. W. Williamson, A. Teichert & Son, Inc., Sacramento; F. E. Brown, Hutchinson Co.; Robert Mitchell, and Harry D. Jumper, Consolidated Rock Products Co.; W. G. Bradley, and L. F. Dewald, Blue Diamond Corporation; Paul C. Graham, L. I. Johnstone, and Frank B. Hagan, Graham Bros., Inc.; John D. Gregg; L. D. Howland, Azusa Rock & Sand Co.; Lloyd C. Corser, Saticoy Rock Co.; L. R. Howard, Montalvo Rock Co.; C. D. Woolsey, El Rio Rock Co.; Boyd E. Oliver, California Rock & Gravel Co., San Francisco; Jere Bowden, Service Rock Co., Riverside; Geo. Thwing, Triangle Rock Co., San Bernardino; Herb Hershman, The Asphalt Institute; Raymond Harsch, Shell Oil Co.; W. W. Dennis, Rock, Sand & Gravel Producers Association of Northern California; H. G. Feraud, Southern California Rock Products Association.

A later meeting in Los Angeles will be reported in the next issue.

# PAN AMERICAN ISSUE

By VICTOR J. AZBE*

## Introduction to LATIN AMERICA

**Traveling 20,000 miles by air, Mr. Azbe visited Mexico, Central America, and South America to bring to our readers this story of progress and opportunity in the rock products industries of these countries.**

THIS WORLD of ours is undergoing a great and very rapid change, and to keep up with it to even small degree demands first the refurbishing of one's geography, and reorienting of one's view to the globe as a whole. As aviation revolutionized warfare and made the World War possible, so also will it revolutionize the days of peace, our daily lives, and our relationships to other people of this time-shrinking globe.

In the more densely populated sections of the States there long have been means for ready interchange of ideas and goods. In other more remote regions the lack of means of rapid and cheap transport has held back the inhabitants to a simpler and often more difficult state of existence and livelihood.

We are too prone to forget the immense land tracts to the south of us where there are 22 countries with a population exceeding that of the entire United States. There are tiny countries and very large ones, Brazil being larger than all our states combined, and inhabited with people ranging from the primitive Indian of the "Green Hell" regions, through all stages in civilization up to the highest cultured, gentle but proud descendents of old races.

Thus far, South American development has suffered because the countries depended too much on exports and imports. They have not been great consumers in themselves, neither have they been industrial producers. Differently than in the States, they have relied on prosperity to be brought in from over their borders through exportation of beef, coffee, fruits, minerals and other products. In turn they imported goods because their industries were not developed. If they produced anything the cost of production was likely high because their labor and their management were untrained and inefficient, and there was little multiplication of effort.

This was all in part because the standard of living is low and there is a low standard of health and of education. What would happen to us, with our normal industrial production worth 57 billion dollars and exports of only 7 percent, if our own standards of personal demand would not call for some of the goods not even dreamed of by medium and well-to-do classes in South America? But this condition is now in the process of changing.

Thus far, South American development has suffered also from transportation handicaps. One cannot have development without commerce nor commerce without transportation. With the exception of along the ocean shores or up the Amazon system and a few other navigable rivers there has been little. This also is now changing as revealed in Mr. J. A. Posse's article in this issue.

In South America, the Pan-American Highway still awaits completion. Compare this with our own wonderful road and railroad system and then reason what our country would be without them. We may say that the covered, oxen-drawn Conestoga wagons opened up the west, but we do not really mean it; the railroad opened up the west.

But what may be economically possible here may not be in South America. A road system in the Amazon Valley or in the Andes mountains is something altogether different than one through the Kansas Plains or Argentinian plains and centuries, many of them, would have passed before any sort of adequate transportation system could have been practical or economically possible in some sections.

However, air transportation will work changes, not in a generation, but most likely in a decade and of a magnitude which centuries have not been able to accomplish. The change is going on even now. New industries and new cities are evolving, and many American concerns are expanding to the south, to cooperate in a mutually benefiting manner with our southern neighbors. The approach now seems to be different entirely from practices in the past

*Consulting engineer and editor.

when the aim was to export a country's raw products and import in exchange items which the country could have produced itself, thus sapping these countries of their natural strength and leaving them materially poorer.

Self-sufficiency wherever possible should be cultivated, resulting in increased local industrial activity and eventual greater import-export capacity.

Steel, automobile, rubber and aircraft industries are moving south and so are many others, to build plants at the point of demand in cooperation with local capital, and to manufacture with local labor under local management, but under North American technical guidance to the necessary extent. Those who go south will be welcome if they come equipped with knowledge and suffused with the will of the missionary to help and develop the regions into twentieth century communities.

The management of ROCK PRODUCTS realized the possibilities for rock products industries in the Pan-American countries and decided to have the subject studied through a technical survey in all of these countries. The project was assigned to me since I have rambled over considerable part of the world in the interest of this publication, and gained experience and also because I had clients and friends through South America available as sources for intimate information.

Whether one is active in cement manufacture, lime, gypsum, aggregates, or their products, he may consider himself fundamentally as much the weaver of the fabric making up civilization as an exponent of literature, music, or a recorder of history.

The war has destroyed much and on its account much in the way of needed construction failed to be built. A heavy burden falls on the rock products industry for one, which it will carry with credit, of course, but which it ought to assume broadly and not in a narrow provincial sense. This publication for one proposes to tackle the many problems within its field in an all-embracing international spirit. It assumes this leadership, and with right, as where in all this world are the cement plants, the lime plants, and other endeavors of the non-metallic minerals field in such great numbers, of such great magnitude, and at such high efficiency, as right here in these United States.

It behooves us to teach others of this crumbled up world and such guidance will be well received as different from that in other fields which lend themselves to exploitation. Little of this is possible, little profit will be forthcoming, but *much good accomplished* toward greater friendliness and greater solidarity of nations.

Victor J. Azbe

## THE AUTHOR

**• Victor J. Azbe, the author, is internationally known as an authority on lime and other rock products. He has made two trips to Europe for Rock Products, and has many contacts in Latin America**

While in Washington clearing the passport and having the many papers to be taken along censored and sealed for export, I noticed an inscription on the facade of the Union Station which applies very well indeed.

"He that would bring home the wealth of Indies must carry the wealth of Indies with him. So it is in traveling, a man must carry knowledge with him if he would bring home knowledge."

One great difficulty of it all is that we know so little about Latin-America, little about the many republics and as little or even less about the people occupying them. If we expect to get along well with them that will have to change. With better acquaintanceship, a greater friendliness will develop, while otherwise only more friction and dispute will prevail. Once they could hardly have been considered our neighbors. To go to Buenos Aires, for example, it required a month by ship, while now one can get there in just about two days' time, about 26 hr. flying time for an air line distane of 6000 miles.

The countries to the south of us can be divided into Mexico, Central America, the Caribbean Islands, and South America, which virtually are all independent republics and one as freedom loving as the other.

Sections are to the north of the equator, others straddling it, and still others extend to the south as far as our Canadian border is to the north. Thus many of the regions are in the tropics while others to the south of the equator have seasons inverted to ours and their Christmas falls into their summer.

The range of climate is best exemplified by Chile which stretches north and south for 2600 miles, a close counterpart of our own Pacific Coast, but inverted. Starting to the north, it is hot, dry and bleak like

TABLE I
AMERICAN POPULATION AND AREA BY COUNTRIES

| Pop. Order | | Population | Area | Area Order | Pop. per Sq. Mi. |
|---|---|---|---|---|---|
| 1 | Brazil | 44,116,000 | 3,285,289 | 1 | 13.4 |
| 2 | Mexico | 19,470,000 | 760,290 | 3 | 25.6 |
| 3 | Argentina | 13,518,239 | 1,078,278 | 2 | 12.5 |
| 4 | Colombia | 8,702,000 | 441,651 | 5 | 15.2 |
| 5 | Peru | 8,000,000 | 437,133 | 6 | 18.3 |
| 6 | Chile | 5,044,446 | 286,322 | 8 | 17.0 |
| 7 | Cuba | 4,252,909 | 44,164 | 15 | 91.0 |
| 8 | Venezuela | 3,583,327 | 352,051 | 7 | 10.0 |
| 9 | Guatemala | 3,284,269 | 42,353 | 16 | 77.7 |
| 10 | Bolivia | 3,282,726 | 514,468 | 4 | 6.4 |
| 11 | Haiti | 3,195,000 | 11,069 | 23 | 288.0 |
| 12 | Ecuador | 3,011,072 | 95,036 | 10 | 31.7 |
| 13 | Uruguay | 2,093,331 | 72,153 | 12 | 27.8 |
| 14 | Puerto Rico | 1,869,245 | 3,435 | 26 | 542.0 |
| 15 | Salvador | 1,787,930 | 13,176 | 22 | 136.5 |
| 16 | Dominican Republic | 1,654,993 | 19,332 | 21 | 85.5 |
| 17 | Nicaragua | 1,380,287 | 51,660 | 14 | .... |
| 18 | Jamaica | 1,241,420 | 4,050 | 25 | 27.9 |
| 19 | Paraguay | 1,014,773 | 177,756 | 9 | 5.7 |
| 20 | Honduras | 962,700 | 44,275 | 17 | 21.8 |
| 21 | Costa Rica | 639,197 | 23,000 | 20 | 27.7 |
| 22 | Panama | 653,181 | 28,575 | 19 | 22.1 |
| 23 | British Guiana | 346,982 | 89,480 | 11 | 3.8 |
| 24 | Dutch Guiana | 182,396 | 54,292 | 13 | 3.4 |
| 25 | British Honduras | 59,965 | 8,598 | 24 | 7.0 |
| 26 | French Guiana | 36,975 | 34,750 | 18 | 1.0 |
| 27 | Trinidad and Tobago | 484,900 | 1,976 | 27 | 24.5 |
| | | 133,832,000 | 7,984,272 | | 16.8 |
| United States | | 131,669,275 | 3,022,387 | | 43.6 |
| Canada | | 11,506,655 | 3,069,400 | | 3.1 |
| Europe | | 410,000,000 | 2,100,000 | | 195.0 |

the Mexican Southern California Peninsula, then improving, becoming temperate with large flourishing cities and still further south terminating in forested regions similar to our own Pacific Northwest.

That South America is what it is is not only determined by its people but by its topography which is mountainous in the extreme for a considerable area, and by the planetary wind system induced by the revolutions of the earth creating such regions of heavy rainfall as that of the Amazon River region of Brazil.

In respect to rain, South America compared to North America, is favored. While it has more regions with too much rain, it has far fewer regions with too little. Thus, agriculturally, it is capable of supporting many times greater population than it possesses at the present, although most of it may still need to be freed of insects, disease and tropical forest growth.

While in this air age continually greater emphasis will be placed on air transportation, the bulk of the coastal movement will be by ship and it is hoped after the war in good extent by our ships. Being that most all of South America is located to the east of New York with the Panama Canal on direct line to the western coast, the respective locations are favorable for ever greater inter-communications by this means. We are closer than Europe, we are South America's greatest consumer of goods and, whether they know it or not, their best friend. They, in turn, unquestionably import in value more from us than from all the rest of the world combined.

We have some fairly rich neighbors to the south and many poor ones and for the present we must give up the idea of becoming richer from dealings with those who are much poorer, as that just does not work in the long run. What we need to do is to help them create wealth of their own which will then benefit us.

There are 20 republics in addition to the several possessions, widely ranging in size and population. Table I arranges them in order of population magnitude but also gives the respective areas, area order and population density expressed as number of inhabitants per square mile.

The average income of a Latin-American is low, only about one-fifth that in the United States. In Argentina and Uruguay it is some higher than the average, but ours is the highest in the world and only approached by Great Britain and Switzerland. We have a normal wage scale for common labor of about fifty cents per hour; in Latin-America it is somewhere between five and ten cents. Agriculture without manufacturing can not well pay more and with such a low scale a high standard of living is impossible. Many comforts are lacking, education is neglected, diets are unbalanced and disease is more prone to assert itself with a correspondingly high death rate.

The Inca ruins which stand as a monument to the part "rock products" played in early Latin-American civilization

## Wartime International Travel

A 20,000 mile trip to foreign lands during this war period when everyone is so fidgety and travelers subjected to so many regulations is a difficult undertaking. To just obtain the American passport good for all Latin-American countries, together with visas and permits from all of the 20 odd consulates was a long and exhausting procedure in itself. Then to secure transportation and make reservations was another difficult job. To go—say to Rio, is a fairly simple matter, but to interrupt the trip some 25 times and resume it a day or a week later was only possible by making reservations for each independent hop from one to two months ahead and to never vary the slightest from a schedule. My schedule called for an exact two months' trip and exactly two months it was. Six weeks after starting I was arriving at completely strange places on the exact hour I planned out two months before and it is only through this system that the trip was completed in just two months. Otherwise at least six months would have been required as air travel is extremely heavy and space reservations very hard to obtain.

Cathedrals like this one remain as "permanent" evidence, through rock products, of Spanish influence

This was not my first experience with the Pan American Airway System. Previously, I traveled by their Clipper to Honolulu and back and this trip only added to the great admiration I formed for this very splendid, now world-wide organization. In the strange lands of strange customs and strange language, it was comforting to enter the fold of the Pan American and at every airport I felt a justifiable pride in seeing the winged messengers of American commerce with their stars and stripes coming and going.

I landed at some 60 airports, stopped over at 30, and was in the air about 130 hours. As far as the transportation part was concerned, the trip passed off smoothly but the local customs, police, censorship, and immigration requirements often tended to drive one to distraction. I

had the passport and I had the visas which should have been enough, but was not, as I used up 54 passport photographs for the various permits and my passport itself with some 40 pages was all stamped up. I would not advise anyone to take a similar trip at the present for pleasure, because it is not pleasure, but a great burden which however was made light for me through the many interesting people I had met. The welcome given to me by all familiar with ROCK PRODUCTS was sincere and the many new friends I have formed and now have scattered through these many countries recompenses me many times over for any of the unpleasantness of the trip.

# Mexican Business Outlook

By DANIEL CASTRO F.* and MIGUEL WIECHERS R.†

IT IS at the very kind request of VICTOR J. AZBE, consulting and contributing editor of ROCK PRODUCTS, that we undertake to express a synthesis of our own private views, doubtlessly very similar to those of the average young Mexican businessman, as to the general economic outlook in Mexico, using the opportunity to further a few suggestions which we sincerely hope will be of some practical use to our business friends and associates, good neighbors and would-be investors.

*Chemical engineer.
†Cost accountant and auditor.

Route followed by Victor J. Azbe in his travels by plane through Latin America

It is only too often said that our technicians as well as our labor are somewhat fond of "mañana" and other similar words and ways, but actually our technicians are striving to establish norms such as those of the American Society for Testing Materials, and our labor is equal to the best, provided it be reasonably well paid and humanly treated.

During the last decade there has been a hundred-fold expansion and development in every field, along the lines of small and medium-sized enterprises, for capital is as yet insufficient to think in terms of mammoth concerns, and our plants are being revamped, remodeled and generally modernized, inasfar as the existing war conditions permit.

The Mexican Government is endeavoring to obliterate illiteracy among our people, and is making every effort to improve the general standard of living to provide our industry with an ever increasing market.

## Many Plants Obsolete

Our machinery is old and often obsolete, spare parts are rather scarce and we must often improvise as best we can to keep our plants on production schedules, yet our products allow fairly wide margins, due mainly to our comparatively low elements of cost.

It would be indeed a good idea if exporters and manufacturers of machinery and equipment were to provide us with direct branch offices and ample stocks, specifications and technical catalogues in our own language, all prices in our currency and measures in the metric system, as well as clear and complete instructions on the installation, care and maintenance of their machinery and equipment.

It must be considered that we often lack appropriate facilities for major repairs, that it is something of a problem to replace other than standard bolts and nuts, and that we cannot very well afford to keep our plants inactive while waiting for priorities, recommendations and the like to go through the proper channels.

Finally, we wish to voice a hope that the "good-neighbor" policy will be maintained by all parties concerned, ever improving upon it toward a united and friendly Pan-America, extending from Canada to Patagonia.

# Mexico Building Cement and Lime Plants

## Highways, public works, new industries and housing call for huge quantities of cement, lime and aggregates

MEXICO is a great study in contrasts and is experiencing a new production era which is contrasted by primitive handicrafts. There are modern pathways of commerce, highways, railways, skyways, contrasted by disappearing cobbled lanes.

There is a continually increasing number of great, modern busy cement plants scattered over the country, producing the cement that Mexico is coming to rely on due to the shortage of steel.

There are contrasts in methods of production. There are lime kilns of the most ancient sort and plants are being built that will produce quicklime, hydrated lime, masonry lime, puzzolanic cement and portland cement. There are contrasts within plants themselves. On one hand, we find an oil-fired rotary kiln and on the other a man feeding a crusher by hand, dropping stone by stone into its jaw.

There is a contrast between the elaborate homes of the rich and the hovels of the poor, but Mexico, while not a melting pot like the U. S. A., certainly is a boiling pot within which a social and industrial revolution is taking place of a sort which one can condone. At the present one of every five children dies, and the death rate is twice that of the States.

There is great illiteracy, some 48 percent, but the order is out that beginning on a certain date, any one who is able to read must teach someone who is unable to do so. How successful this will be remains to be seen but the order certainly is an indication that Mexico is determined that its poor and illiterate population will become literate, and will soon live on a higher standard of comfort and health than was possible in the past.

The present ruling party of Mexico plans on freedom from foreign capital insofar as possible. They are all out for full economic and political autonomy. They blame their past-undeveloped state on a scarcity of natural resources, on the survival of feudalism and on foreign imperialism. As they are without steel, and without a chemical industry, or electricity, they cannot well become self-sufficient, but we should help them to become so to the extent that they can. An industrially efficient Mexico on a higher standard of living will be worth far more to us and we worth more to them.

While in Mexico I found two very good friends, Daniel Castro F., chemical engineer, and Miguel Wiechers R., accountant and auditor, who are in close contact with the Mexican situation in its agricultural, industrial, banking and purely mechanical aspects and so are qualified to present their views. I asked them to put down their more formal views in writing and so I was given two short articles. One deals with the general business outlook as it concerns Mexico and us, the other deals interestingly with lime mortar of which so much is used in Mexico. In these latter respects, these two men are particularly qualified through their connection with the Cementos Anahuac, Tlalnepantla, Mexico. At the time of my visit they were constructing a plant that is to be entirely modern and far more interesting than any cement plant or any lime plant that I have visited. It is to produce cement clinker and lime, and will be equipped to compound and grind these products with puzzolanic clay into mortars and cements of various desired and correctly controlled compositions.

Mr. Castro, Mr. Wiechers and myself found much in common and we had many pleasant meetings and discussions. In one of these we even formed a Union Pan Americana de Ingenieros de Productos Minerales Non-metallic. We felt that there was a need for such an organization because, with the exception of cement, which is manufactured by a standardized process and because cement

Crushing and screening plant furnishing aggregates for a section of the Pan-American Highway through Mexico

Typical portable crushing and screening plant supplying aggregates for the Pan-American Highway

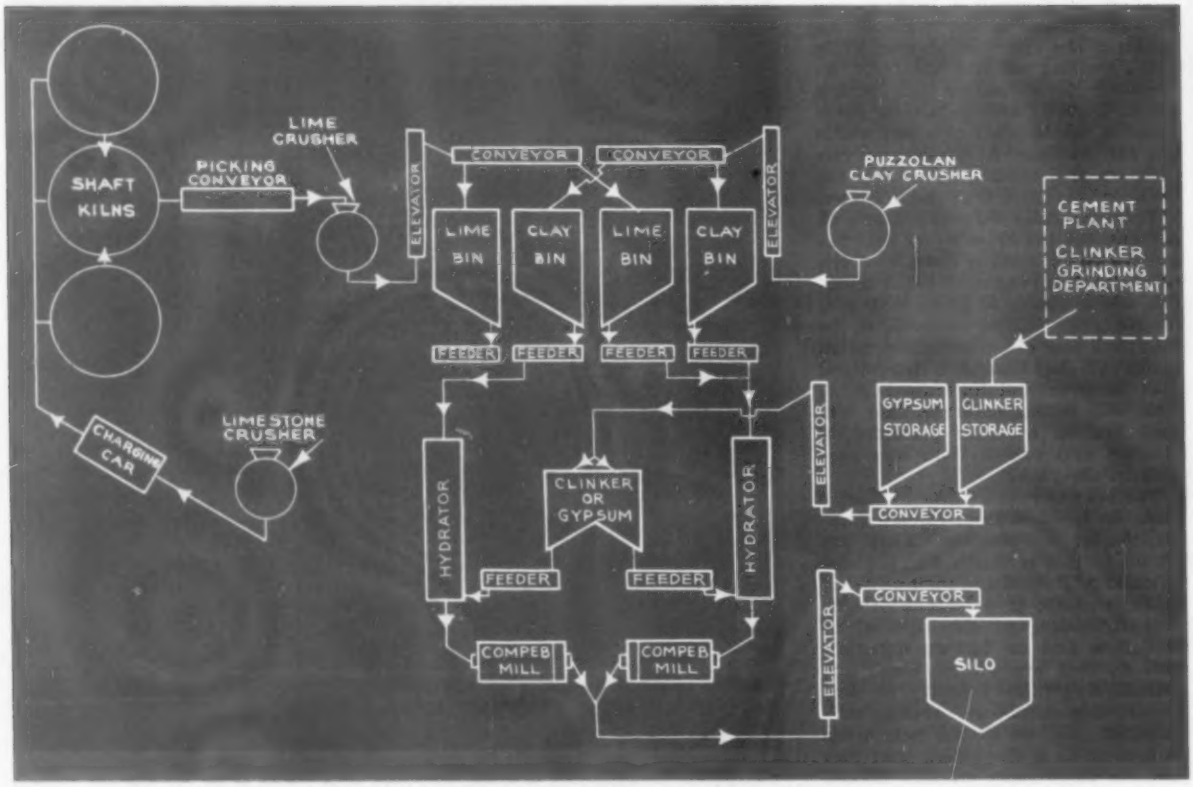
plants are more or less the same whether in the United States or Brazil, in other lines of rock products information is not well disseminated. For example, in Mexico they know little about U. S. practices in lime manufacture or methods used in any other country south of the border, and vice versa. In Chile producers know nothing about practices in Argentina and Argentinians know nothing about Chilean or Brazilian practices or developments. So, an organization of some sort, a strictly informal one, with no dues or assessments, but organized for an exchange of information from Alaska to Tierre del Fuego is quite in order and was so formed.

Labor in Mexico is cheap expressed in our money, but because it is cheap it is used inefficiently.

## MEXICO HACE PLANES PARA NUEVAS FABRICAS

• En este artículo el Sr. Azbe presenta un gran contraste entre las operaciones poco eficientes y las instalaciones de mejores productos pétreos que ha observado en México. Habla de la construcción, ahora en progreso, de una fábrica en México que él describe como una de las operaciones de las más interesantes que ha presenciado en sus viajes por todo el mundo. Esta fábrica producirá escoria de cemento y cal que puede ligarse y molerse con arcilla puzolánica en varios morteros y cementos especiales.

Nuestros lectores panamericanos se interesarán en saber ques el Sr. Azbe, en cooperación con nuestros amigos mexicanos, formó la Unión Panamericana de Ingenieros de Productos Minerales No-Metálicos, uno organización que se dedicará a divulgar información sobre las industrias de productos pétreos entre todos los países. Este es un paso hacia la propia dirección, ya que el objectivo de todas las Américas debería ser ayudarse mutuamente.




Layout of hydraulic mortar plant being built by Cementos Anahuac at Tlalnepantla, Mexico—a versatile operation

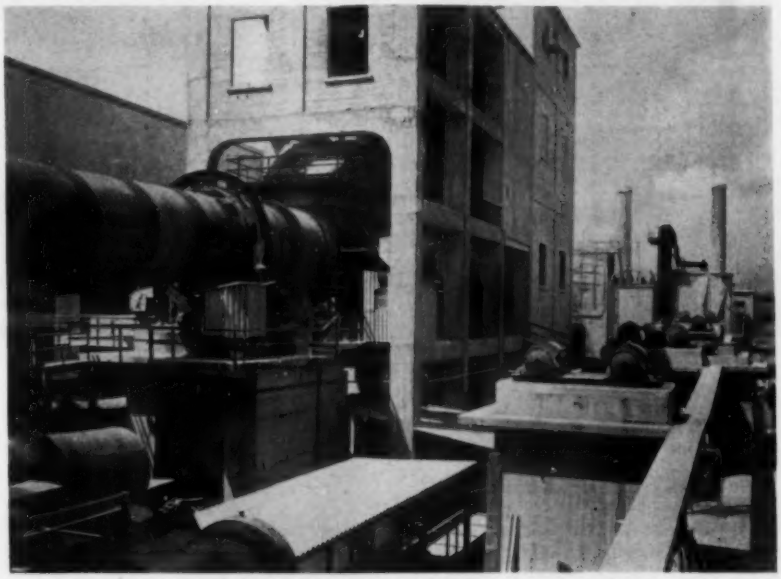
# LIME MORTAR AND CEMENT

By MIGUEL WIECHERS R.

As a courtesy in exchange for the kindnesses of Victor J. Azbe, consulting and contributing editor of Rock Products, who has seen fit to enroll me in his "Union Pan-Americana de Técnicos de Industrias de Productos Minerales No Metalicos" (Mexican Chapter), I will hereby unsheath my somewhat rusty and very "creaky" English, demanding a reasonable and "good neighborly" understanding, with a sincere hope that my effort will be duly appreciated, in order to offer my own interpretation as to the past and present development of the lime and cement industries in Mexico.

In bygone days of "cross and sword," the audacious and never too well admired followers of Hernán Cortes were inclined to cement practically all their construction, most of which still stands today, with what we, very late descendants, fancy as "Spanish-Mortar," mainly consisting of three parts of pure calcinated lime and one part sand, mostly puzzolanic.

As late as 1890, cement began to be used in our construction, mainly for kitchen and back "Patio" floors, part of which was imported and part manufactured in vertical kilns in the "Roman" way. It was in the late '20s that some over-bright native engineer discovered that concrete construction would withstand better the ill effects of frequent earthquakes and assorted tremors than the widely used methods of Spanish construction; stone, wooden rafters, red brick and tile, cemented with "Spanish-Mortar." Thereafter concrete construction became well known and widely used, particularly in the Mexico City area. Once it was an established fact that the extremely wet sub-soil of the Valley of Mexico, once a series of lakes, would withstand the enormous weight of modern "skyscrapers" if "piloted" with wooden poles in sufficient quantities, many storied buildings began to spring up, in contrast to the flat and squatty one or two-storied construction of old, and so the lime mortar industry was born so to say. It was found increasingly difficult to slake lime in each particular story as of old. Frequently there was no available means of pumping the necessary water to slake lime with, which led to the manufacture of ready hydrated lime, combined with some proportion of puzzolanic sand and gypsum to render the product hydraulic and to delay "setting."



New cement plant of Cemento de Mixcoac, S. A., under construction

By that time, the demand for lime mortar and portland type cement grew enormously and several new plants were built to increase production, while still importing considerable quantities. When the present war came, such importations were indefinitely suspended, as there were no means of transportation available. Yet the demand grew on and on, due to the scarcity of structural steel, to build new plants for extractive industries to further our war contribution of metallic and non-metallic minerals, as well as for the export preparation of a good many other raw materials and to supply the internal demand of such every-day products as could not be imported.

While struggling with great difficulties, several new cement plants are just about to enter production, using remodeled mining equipment, second-hand kilns, and the thousand and one miracles of improvisation of which Mexican mechanics and technicians are quite capable. These new plants, at Orizaba, Leon, Lagunas, Cuernavaca and Barrientos, and improvements on the already established plants, such as larger kilns and an increase in its number, will just about double the production, but it will still be unable to meet the expected post-war demand.

Later on, if production ever meets the fast growing demand, practically all our plants will have to be revamped and remodeled to meet com-

(Continued on page 108)

Rushing work during the short dry season on the Tuxpan Highway near Tenosique, Mexico. Rainfall at this point sometimes reaches 15 ft. annually

Guatemalan National Palace constructed of concrete to withstand earthquakes

# Business Boom in Central America

IN GUATEMALA there is a rather nice portland cement plant of Fabrica Nacional de Cemento, operated by Edwardo Alfredo Novella, manager, and Henry Carlos Novella, superintendent. Both of these gentlemen were educated in the States. Carlos attended school here for ten years, high school in Mobile, then Rensaeler Institute and finally the Georgia School of Technology. During my visit it was Carlos Novella who took care of me and he was of considerable assistance.

### Manufacture Both Lime and Cement

They have one 7- x 100-ft. kiln with a 5- x 50-ft. rotary cooler which produces 400 to 450 bbl. of cement a day with a fuel consumption of 20 to 25 percent calculated on the basis of clinker production. They were just completing the installation of another kiln, 6- x 7- x 180-ft., which is equipped with a 6- x 50-ft. rotary cooler, from which they expect to obtain 600 bbl. of cement per day. When the new kiln is put in operation, the old kiln will be converted to the production of lime with an expected output of 40 tons a day.

The lime will be hydrated and most of it will be used by the United Fruit Co., for spray purposes. This is interesting as certainly little lime is used through the rest of the Americas for this purpose. Their hydrating plant is better than any we found; in fact very few up-to-date hydrating plants were found. Lime ordinarily is spread on the ground, sprinkled with water and raked, which is something I have not seen for many years and that was in Europe.

The oil costs the Novellas $3.50 per bbl. (42 gal.) and electric power 1¼ to 1½ cents per kw.h., but they were considering installing their own hydro-electric power plant.

Of greatest interest are their labor rates. A kiln operator receives 60 cents per 8-hr. day and ordinary labor is paid 6 cents per hour, but they are also given homes and free medical and dental service. There is also a sort of pension system. When the workers get old they are given easier jobs and when they become too old they are kept on the payroll anyway. Even through the depression, the men and their families were taken care of.

In the quarry, the company pays for drilling and primary and secondary blasting. The rest of the operation is handled by contract. They operate Dempster Dumpsters and pay the loader 30 cents per cubic meter or 1¼ yard of stone. He does the picking, sledging and loading and also takes care of clay and waste stone with no extra pay. The loader has the right to engage a helper and the two ordinarily load 7 to 8 cubic yards of stone a day.

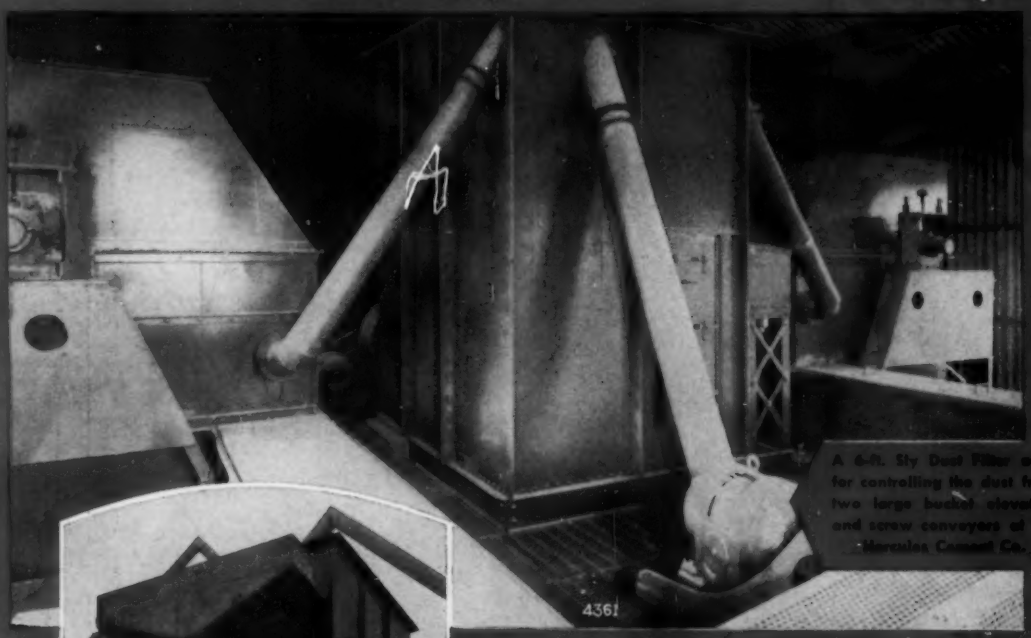
Iron used in the manufacture of cement is Guatemalan, some of which runs 90 percent $Fe_2O_3$. The country has plenty of ore, mountains of it, but has no fuel except wood. There is no coal or oil.

In manufacturing cement, they follow U. S. specifications. There are no local specifications so they establish their own standard, but the country has complete confidence in the company. The earthquake of 1921 turned most large construction towards reinforced concrete. The National Palace, illustrated herewith, is built of reinforced concrete and many downtown streets are of concrete construction.

The company has several lime kilns one of which is a vertical Keystone kiln of 11-ft. diameter equipped with four wood-burning direct-fired furnaces. The capacity of this kiln is only five to seven tons per day. In addition, they have six or eight pot kilns. These will be described in our article on lime in this issue, but we will point out here that the pot kilns make 25 tons per run and a run consumes about ten days. For four days the kiln is charged, for four it is fired and for two it is cooled and then the lime is drawn. When fired it smokes heavily. Its fuel efficiency is extremely low, and so is the labor efficiency. But they say a pot kiln makes nicer lime than the Keystone kiln which is rather likely as inefficient burning conditions mean low temperature of burning and so softer burned lime. But lime which has cost $4.00 per ton now costs $10.00 and its cost after the war depends on the price of wood which never again will be the $1.75 a cord it originally was. Despite low labor rates and low stone cost, the lime is costly, due to high labor costs and high fuel costs. The

*(Continued on page 79)*

A big majority of the people in certain Latin-American countries, like Guatemala, live in palm-thatched bamboo huts like this one



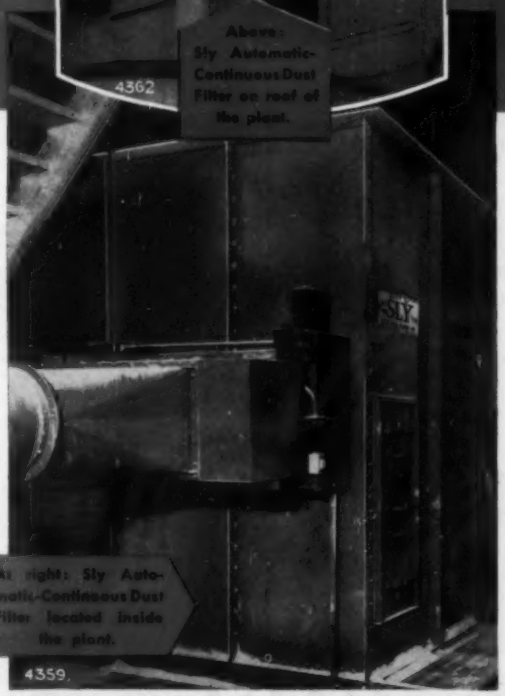
A 6-ft. Sly Dust Filter used for controlling the dust from two large bucket elevators and screw conveyors at the Hercules Cement Co.

4361

# Important Savings with SLY DUST Control

Above: Sly Automatic-Continuous Dust Filter on roof of the plant.

4362



At right: Sly Automatic-Continuous Dust Filter located inside the plant.

4359

● This large modern plant of the Hercules Cement Co. uses both automatic and automatic-continuous Sly Dust Filters.

Only Cloth-Screen Type Filters will collect the really *fine* dust. Compared with other cloth-screen filters, Sly provides greater filtering capacity, power savings, easier bag replacement, automatic control, and effect important economies in operation and maintenance.

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**INDUSTRIAL DUST CONTROL**

*J. A. Gallagher, Madison, Wisc., contractor uses a Universal 546-P primary unit with 20″ x 36″ jaw crusher in Viroqua, Wisc. quarry. Plant is electric-powered.*

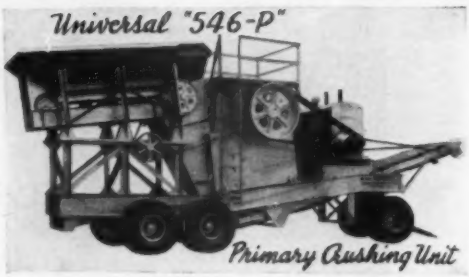
*Below: Beu & Sons use a 546-P primary unit with 20″ x 36″ crusher for primary reduction of limestone at Ackley, Iowa. Secondary plant has No. 4 Universal Pulverizer.*

*The 30″ x 42″ Welded Steel Plate Roller Bearing Crusher on this 546-P Primary Unit increases output for Art Overgaard's No. 1 plant at Cashton, Wisc. This is the third 546-P unit purchased by this operator.*

# Quarries step-up output with this UNIVERSAL Primary Unit!

**These Universal Portable Primary Crushing Units greatly increase output for quarries because larger chunks of shot rock need not be rejected or sledged. In addition, they increase the output of secondary crushers by delivering material of a more uniform size to them.**

**Made in four sizes: 16″ x 24″, 20″ x 36″, 24″ x 36″ or 30″ x 42″ jaw crushers. Apron feeder empties onto bar grizzly with bypass chute for material suitable for secondary unit. Apron feeder can be readily detached and slid off onto a truck to facilitate hauling. Ideal for use with Universal 822-Q, 410-Q, 880 and other plants as well as *other makes* of quarry plants that need to be geared to tomorrow's requirements. Send for details.**

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fuel itself costs $6.10 per ton of lime.

It seems inconsistent to see these kilns operating adjacent to a modern cement plant but when the rotary cement kiln is converted to making lime they may be abandoned. However, the rotary kiln lime is all marked for the United Fruit Co., so for all other purposes Guatemalan lime will continue to come from wasteful kilns.

The company does not attempt to produce any building lime. It leaves that to individual private producers who, however, buy stone from the company, which is a peculiar arrangement not to be found anywhere else. Their Keystone kiln in a modernized version could produce all the lime now used in Guatemala cheaply, at a cost per ton of about $1.00 for stone, 10 cents for labor, and $1.00 for fuel but they, no doubt, know what they are doing. According to our standards, the conditions are odd and require odd treatment.

## Market for Concrete Block

In regard to other rock products, the Novellas tried to produce agricultural stone but the market refused to develop. There is an abundance of soil but the peons use a plot here and then there and do not bother with any soil conditioner. However, all hydrator rejects are sold for $4.00 a ton. They made concrete block but the market would not react due to the very low price brick which at times sold as low as $5.00 per 1000. At the present time, however, it would be a profitable venture.

They sell concrete aggregate and filled the order for 100,000 tons of crushed stone for the Guatemala City airport. The contract called for completion of the order in three months. Sand and gravel, which are said to be a good quality, are dug by hand out of the rivers.

Guatemala is a pleasant, picturesque country with an ideal climate and would appeal to many since the average and not too well to do family has about four servants. The labor rate the company pays seems low, but are the highest in the country. Guatemala invites foreigners far more than Mexico, in fact, almost prefers foreigners to its own people.

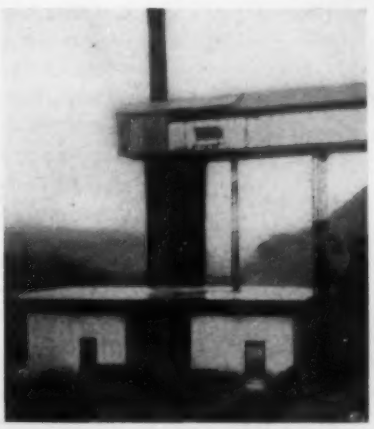
Much information was also obtained from Mr. Louis Schlesinger Carrera, a former Guatemalan Minister of Education, who when Mayor of Guatemala City changed the city roads to concrete.

Guatemala has a population of over three million, but that does not mean so much since it was said that 80 percent of the inhabitants are neither producers nor consumers. They live simply and off the country, make their own clothes, even to the shoes and sell only enough to buy some liquor occasionally.

One of several pot kilns of Fabrica Nacional de Cemento, Guatemala, is in striking contrast to company's modern cement mill in background

In U. S. and Canada, everyone is a consumer as everyone buys something, but this is not so through all of the South American countries. In every country, except possibly Uruguay and large sections of Argentina, there are big portions of the population who from an economic angle are virtually nonexistant, living in split bamboo, palm thatched huts with complete self sufficiency. It really seems that when forming international agreements this should be considered. The determining factor should be not how large is the country, or what is its population, but rather what is the average I. Q. of its inhabitants, its production capacity and its contributions to the world economic pool.

It is due to this also that we should not expect governments in many other countries to be as the governments in U. S. and Canada are.



Vertical 11-ft. diameter, wood-fired lime kiln of Fabrica Nacional de Cemento in Guatemala

While stops were made in all Central American countries, time did not allow me to stay over except in Guatemala, Nicaragua and Panama. In Panama everything is so tangled up with the Panama Canal and its defense undertakings that the economic picture was too complex to reason out in the time available. One does not hardly know where the U. S. stops and Panama begins.

## Nicaragua

The stop in Managua, Nicaragua, also did not produce much because there was not much to produce. There is a cement plant, Cia Natl Productora De Cemento. The plant was started in 1942. One 6- x 154-ft. oil fired kiln produces about 65 tons of cement per day. It is the only cement plant in Nicaragua and they are unable to produce enough and contemplate expansion. They have a contract for 34 km. of road reaching from Managua to the Pan American Highway, and a harbor construction contract. Many downtown buildings under construction are of concrete. The company is too busy putting out as much cement as it can to worry about producing lime or anything else. Some lime is produced in pot kilns. The sand and gravel is obtained equally crudely from sand and gravel pits.

One should not ever forget to mention the small, but most beautiful Costa Rica. It is well settled and agriculturally advanced, of good climate and a high order population, mostly Spanish, and is of more pronounced democratic tendencies than probably any other Central American state. A large proportion of the country's inhabitants are land owners and so communism is unable to assert itself. It is not an industrial country.

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Las tachuelas blancas indican fábricas de cemento completas, totalmente equipadas con maquinaria Smidth.

Las tachuelas negras indican fábricas de cemento equipadas en su mayoría, pero no en su totalidad, con maquinaria Smidth.

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The white tacks indicate complete cement plants, fully equipped with Smidth machinery.

The black tacks indicate cement plants, mainly, but not fully, equipped with Smidth machinery.

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# CONCRETE Used Extensively in Colombia and Venezuela

**New concrete products plants are being built. Gypsum and lime developments are not advanced**

THESE two are the northern-most countries of South America. In Colombia the national economy is geared to coffee. In Venezuela it is oil, Venezuela being one of the world's foremost producers.

In the past I would have claimed that lime consumption could serve as an index of a country's advancement. Now I would say it is cement.

Colombia, Venezuela, Ecuador and Peru are responsible for my change from lime to cement as an index. Lime kilns are hard to find. I found them but they were even greater crudities than the Guatemalan pot kilns. Still Colombia had five companies with six cement plants of 1200 tons daily capacity. They are:

1. Cementos Del Valle, S. A. Cali, Colombia, producing "Conquistador" in F. L. Smidth kilns.

2. Compania del Cemento Samper, Bogota, Colombia, producing "Titan" in Polysius kilns.

3. Compania de Cementos Argos, Medellin, Colombia, producing "Argos" in F. L. Smidth kilns.

4. Compania de Cementos Diamante, Apulo, Colombia, producing "Diamante" and at Bucaramanga also producing "Diamante" in F. L. Smidth kilns.

5. Compania del Cemento del Nare, Nare, Colombia, producing "Inmarco" in Edgar Allen kilns.

The superintendent of production of Cementos Del Valle, Mr. Enrique Velasquez J., was very kind and although it was difficult for us to understand each other we did cover many subjects.

This plant has an 8.8- x 7.5- x 253-ft. F. L. Smidth kiln operating by wet process, equipped with a planetary cooler, producing 5500 short tons of cement a month. Fuel is coal of 13,500 B.t.u. semi-anthracitic variety and fuel consumption is 240 kilos per 1000 kilos of clinker.

A price of 40 pesos for a metric ton is obtained at the plant. As a Colombian peso is 58 cents and a metric ton 2200 lb., that makes it $21.09 per short ton in our money.

An ordinary workman earns about 54 pesos per month, which is one and a half pesos for eight hours or 87 cents. A kiln fireman's wage would be some higher, which is a better paying scale than that prevailing in Guatemala. But this does not help him any as the cost of living has increased greatly during these past four years. Food, clothing, housing and fuel, when compared to 1936 as a 100 percent level are high. In 1940 it was at 114.6 percent, while in 1944 it is 174.2 percent.

Workmen in North America do not realize how well off they are. The lowest paid laborer up north can and does live far better than an important foreman anywhere south of the border. Business is booming, and there is great prosperity, but the cost of living is so high in relation to the wage rate that the workman has to live at a lower standard than ever. Much of it comes from profiteering of course. Steel plate before government price control came in in 1943 cost $378 a ton. After price control was established it cost $163, while here the cost of mill cut structural steel is $80 a ton.

### Concrete Products in Colombia

I called on Knud F. Jensen, a producer of concrete products and also an importer of all imaginable building equipment and other materials. Throughout these countries, the manufacture of tile is a great industry and he had floor tile, roof tile, and tile of all sorts in many beautiful designs.

He is an old F. L. Smidth, Copenhagen, man who came over for the company and later established himself in a business of his own in which very evidently he prospered greatly. It was a great pleasure to talk to him and he was quite informative. I asked him to tell me what they think of Americans, which he did, as follows:

"Americans themselves changed a great deal in the last few years. They know the local inhabitants better and the latter like them better. They like them particularly for their practicability and audacity of dispensing bluntly with old obsolete practices. For some fundamental psychological reason no one can touch the American in this."

Later when waiting for the airport taxi, I walked over to the local bridge where some repair work was going on and I seldom witnessed a job performed less efficiently. There was one of the smallest batch concrete mixers with ten men feeding and operating it. The concrete in the small batches was chuted below in a manner conducive to the greatest segregation and there were 15 more men disposing of it in a manner which made one think that not one of them had a head on him.

What they lacked was a hardboiled American foreman who would reason less in terms of what he pays his men as in how much time and how well they accomplished the job.

In Venezuela there was a great oil-induced prosperity with the cost of living higher than anywhere else and with the poorer classes pinched hopelessly. In our country the tendency is to employ few, pay them well and use them effectively. Down there they prefer to employ many and pay them poorly.

Southern countries will never be truly free, as long as they depend on exports. They never will be really prosperous until prosperity is based on their own consumption and production and that only is possible when the manpower is well paid and effectively utilized and competition is allowed its free sway.

### Venezuela Uses Concrete for Construction

The following information was, in part, obtained from Mr. Osborn J. Watson, the American Commercial Attache:

Most construction in Venezuela has utilized concrete, brick, tile in large quantities. In Caracas there are great housing developments, likely the most extensive of all South America. However, cement production is 120,000 metric tons per year

### EL CEMENTO Y LA CAL EN MEXICO

• El autor descubre el desarrollo del uso del motero de cemento y cal y su aporte a la construcción en México, página 73. Habla de las nuevas fábricas de cemento que muy pronto estaran listas para la producción en Orizaba, León, Lagunas, Cuernavaca y Barrientos, y de la expansion de las fábricas existentes, mediante el agrandamiento de los hornos y la instalación de más caleras. Cuando llegue el momento, esta producción abastecera la creciente demanda y predice el autor que separadores de aire en circuito cerrado con molinos y colectores de polvo, mencionando sólo algunas de las instalaciones que prevalecen en los Estados Unidos, serán instalados en las fábricas mexicanas.

# You Don't Have to Baby 'Em ..but PROPER CARE is GOOD BUSINESS!

1. STRIPPING overburden with T4 TRAXCAVATOR at a California Quarry.
2. LOADING trucks with quarry rock with a Model T4 TRAXCAVATOR.
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or only about half the normal requirements. There are now two cement plants operating, at Caracas and at Valencia, and four or five more are projected for the time when equipment may become available. These plants would have a capacity of 180,000 tons, making Venezuela self-sufficient in cement.

Plans have been completed and capital subscribed for the erection of an asbestos-cement plant for the production of shingles and building board and other products. Due to scarcity of metals this product is used widely through all of the south. It is strong, durable, corrosion resistant, fireproof, and available.

Petroleum production is the barometer of Venezuelan economy and post-war construction will depend upon these operations. Steadily increasing petroleum production and extensive exploration work in this field, with corresponding rise in national income, indicates that the already existing construction urge, somewhat pent up by lack of certain imported materials, will be unleashed when the supply situation permits.

Estimated annual construction expenditures for the immediate post-war period, excluding highways and railways (for first two years):

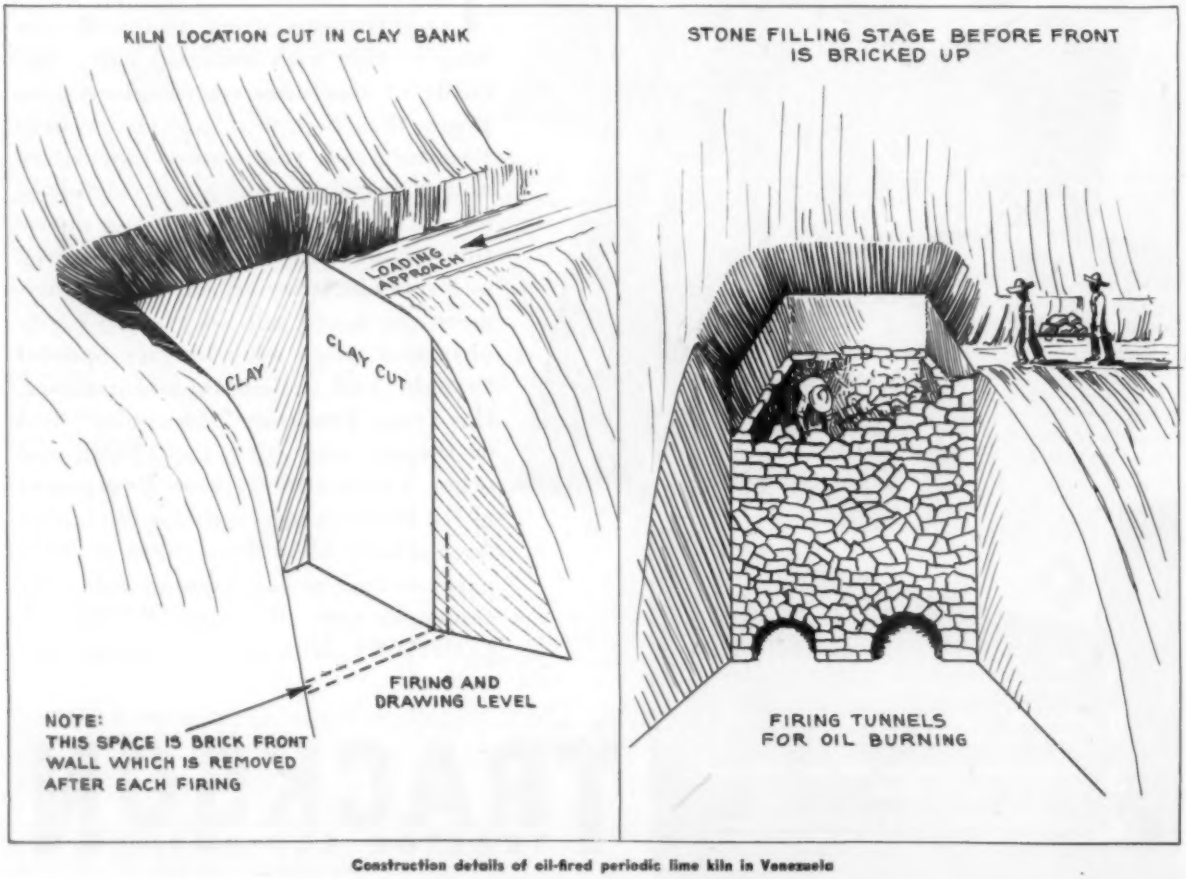
| | Bolivars |
|---|---|
| Port works | 8,000,000 |
| Airports | 2,500,000 |
| Buildings | 170,000,000 |
| Bridges | 3,000,000 |
| Irrigation and flood control | 3,500,000 |
| Water works and Sewerage | 20,000,000 |
| Street paving, parkways, playgrounds | 10,000,000 |
| | 217,000,000 |

In Caracas I made a very good friend, a Belgian who escaped from the Germans and whose business now is the importing of equipment. He was a delightful and most capable man for whom we felt very sorry knowing that in spite of all sorts of efforts over several years he is not able to obtain any information about his wife and daughter. He introduced me to Dr. P. Ochoa, chief chemist of Compañia Cemento Portland Nacional, who showed and explained the cement plant to me. It is a remarkably clean plant, operated by dry process since there is no supply of water. The company's Valencia plant is wet process. He said that the inconvenience of dust in the dry process plant balances with the inconvenience of the wet process at the other. However, being close to Caracas, they must be careful and the kiln gases are passed through Buell dust collectors which have an 80 percent efficiency in the collection of stack dust.

The plant was unusually clean and well kept, and was operated under exact laboratory control. In Venezuela they are putitng up 15 story concrete buildings and the government insists that the cement be made in accordance with the best American standard. They have a very good testing plant and an inspector may pay a surprise visit any time and if the cement is not up to the standard the contracted cement is all condemned. This practice is quite different from the complete lack of control or standards in some other countries.

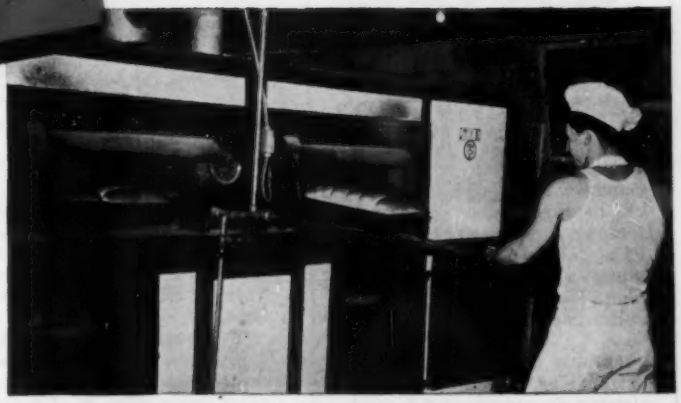
The company started in 1907 with a vertical kiln, then bought a 6- x 100-ft. rotary kiln, of which it now has three, and finally a 260-ft. kiln. The four together have a daily capacity of 250 tons, or an annual production of 75,000 tons, while the Valencia plant can produce 57,000 tons per year. Oil is the fuel, of course, and it is cheap and so they have no great interest in fuel econ-

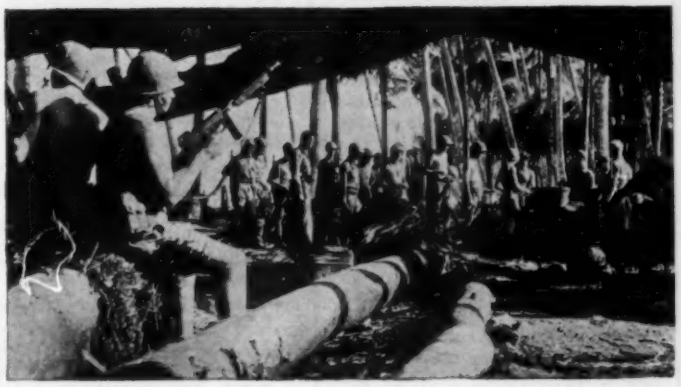
*(Continued on page 86)*


KILN LOCATION CUT IN CLAY BANK
LOADING APPROACH
CLAY
CLAY CUT
FIRING AND DRAWING LEVEL
NOTE:
THIS SPACE IS BRICK FRONT WALL WHICH IS REMOVED AFTER EACH FIRING
STONE FILLING STAGE BEFORE FRONT IS BRICKED UP
FIRING TUNNELS FOR OIL BURNING

**Construction details of oil-fired periodic lime kiln in Venezuela**

# "DELIVERING THE GOODS" for Victory





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***...to Feed the Ovens***
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omy. Stone is cheap, labor is cheap, oil is cheap, about $1.00 per bbl., and power is 1 cent per kw.h.

### Simple Gypsum Plant

Later a gypsum plant was visited, but gypsum plants down there were found to be extremely simple. Large stone was unloaded into a concrete walled compartment and there sledged to small pieces. This was "shoveled" into a mill and ground. The ground material was "shoveled" into oil heated pans. The discharged calcined material was "shoveled" again into a Bell Manufacturing Co. mill to be blown into a long settling chamber.

The coarsest material, which settled first, was "shoveled" back into the mill and the finest was sold to dentists and surgeons. That from the intermediate sections of the classifying chamber was "shoveled" into bags to be sold for ornamental and other purposes. Capacity was small and, in all, the material was hand "shoveled" some seven or eight times.

The Venezuelan lime plant pictured in the section on lime was even cruder. A gouged out clay bank, unlined, constituted three walls of the kiln. The stone was piled in so that at the bottom there were two arched-over spanways. When full, a front wall was built of brick made on the premises and the kiln fired.

### LA AMERICA CENTRAL NECESITA CEMENTO

• El Sr. Azbe hace aquí un resumen de la situación en la América Central en lo que respecta a las industrias minerales no metálicas. Describe la Fábrica Nacional de Cemento en Guatemala y las mejoras que éstra piensa llevar a cabo en la fabricación de cal y de cemento. El Sr. Azbe se sorprendió de que la mayor parte del tonelaje lo usara la United Fruit Co. para rociar; esto puede sugerir una perspectiva digna de investigar en otros países panamericanos. (Página 76)

Aunque los jornales eran en extremo bajos, sin embargo, el sistema de pensiones y las mejoras sociales practicadas por la compañía llamaron la atención del autor de este artículo, y piensa que aun en nuestro país hay muy pocas compañías que estén en posición de cuidar de sus empleados y de las familias de éstos en la forma que la Fábrica Nacional de Cemento lo hace. Felicitamos a los jefes de la fábrica, Sres. Eduardo Alfredo Novella y Henry Carlos Novella.

El Sr. Azbe es una autoridad en la fabricación de cal, por lo tanto, sus observaciones sobre la eficiencia de las fábricas que ha inspeccionado, deberán tenerse muy en cuenta. Aparentemente existe un gran mercado de piedra caliza para el mejoramiento de tierras y el negocio de productos de hormigón podría ser provechoso.

Concluye este artículo con la discusión de las condiciones en general en Colombia y Venezuela, describiendo varias fábricas de cemento en varios países, los proyectos de construcción para cuando se termine la guerra y los planes que están adelantando para abastecer la creciente demanda de cemento.

# Ecuador and Peru Plan Many Post-War Improvements

EN ROUTE from Colombia to Ecuador the plane flew over ever more rugged country, the beginning of South America's high mountain ranges, the Cordilleras Oriental and Occidental where most of the inhabitants live between the depressions. A few live volcanos were passed and mountain peaks ranging up to 20,000 ft. in height.

In Ecuador there is one cement plant which is located in the vicinity of the Ecuadorian seaport, Guayaquil. It is a German cement plant now taken over by an American concern, The Ecuadorian Corp. of New York, of which E. H. Norton is president.

This corporation also operates the Guayaquil brewery, a dairy farm, candy factory, cattle ranch and has other properties in Uruguay, Chile and Argentina.

The plant superintendent, F. R. Taylor, is one of those Englishmen who possesses the world. He contributed his labors to the development of Siam, South Africa, China, Brazil, and now Ecuador.

### To Build New Cement Plant

The plant manager, an American, was for years associated with Kennedy Van Saun Engineering and Manufacturing Co. Mr. J. E. Grindel and his charming wife made my stay in Guayaquil as pleasant as any I had on the entire trip.

The plant, Cia da Cemento Nacional, producing "Rocahorte" cement, had two 6- x 100-ft. rotary kilns equipped with rotary coolers. One of the kilns is of Krupp-German make, the other, the new one, was installed by Kennedy Van Saun Engineering and Manufacturing Co. The plant is 23 years old, poorly located, and poorly designed and is cluttered up with conveyors and bucket elevators. At the present, for a normal production of 70,000 sacks per month, it has 380 employees. Mr. Grindel is designing a new, modern plant which he hopes they will allow him to locate more favorably, and in which he expects to be able to reduce the labor force by half.

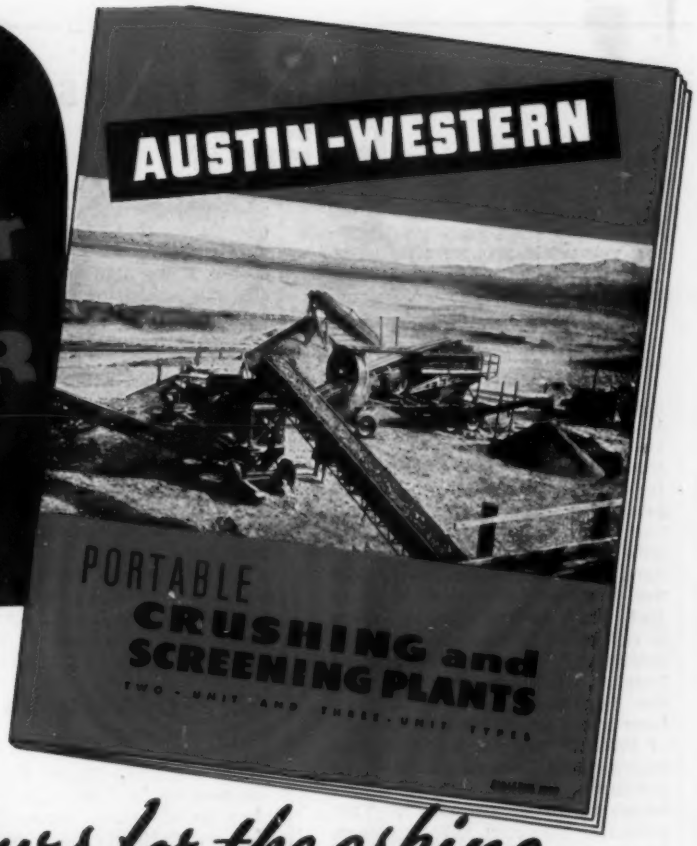
The labor force is difficult to handle. The people either like you or ignore you, but they have taken to Mr. Grindell and his wife. Their appreciation of them was shown touchingly on Mr. Grindell's birthday when there was a great fiesta given by the employees in his honor.

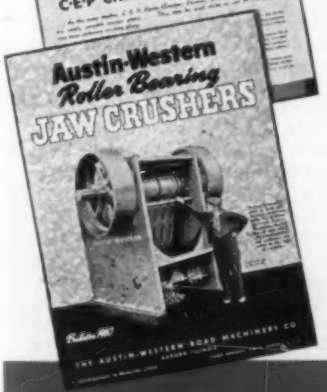
In Lima, Peru, I called on the manager of the Compania Peruana de Cemento, Señor Carlos Lopez Larranaga, who operates the one cement plant in Peru, which is the largest and most modern of any I encountered so far on this trip. The three-kiln plant has a capacity of 3500 barrels of cement per day, which when a fourth kiln is installed will be increased to 5000 barrels.

I was very anxious to see E. L. Drury, technical director, but other matters interfered. However, he was so kind as to write me a letter on the Peruvian rock products situation which, contrary to his opinion will prove, I am sure, extremely interesting to ROCK PRODUCTS readers and is here published as an article. What he says in describing Peruvian conditions applies as well to some other South American countries.

Senor Carlos Lopez Larranaga, manager De La Compania Peruana de Cemento Portland

# Guides to Greater POSTWAR Profits



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# Rock Products Industry In Peru

By E. L. DRURY

I AM certainly sorry that I did not have the pleasure of meeting you while you were in Lima. I have been a subscriber of ROCK PRODUCTS since about 1924 and enjoy reading it from cover to cover and more so since I have been here in Peru.

Briefly I will try and answer your questions although, looking things squarely in the face, the rock products industry and allied industries here have more room for advancement than present day perfection. When you stated that you were not very well satisfied with your work in Peru I do not doubt but what you have fairly well summed up conditions here and, when having done so, there is not much to consider as being interesting for trade journal publication. However, starting with the Peruvian Cement Co., they have today an effective production of 4000 bbl. per day which will be increased to 5000 just as soon as machines can be delivered and which are pending shipment. This company produces only standard portland cement, using the dry process. Raw materials are limerock which is very similar to the cement rock of the Lehigh Valley, and as a general rule about three percent of shale as a correcting medium. The cement produced easily passes the A.S.T.M. specifications, and is rapid hardening due to the high aluminum content. Since 1938, they have doubled their capacity but at present are unable to keep pace with the local consumption.

Referring to lime production, as far as I know there is not a decent lime kiln in Peru. By far the greater part of the lime is of a very low grade due partly to the uncontrolled method of manufacture and partly to low grade material. I might state here that high grade limestone is more or less a rare article in this particular part of the coast and the hills which you noted run about 90 percent silica. Hydration of the lime for the building trade is brought about by simply dumping water on the burned lime which has been spread out on the ground. Lime for plastering is unknown here and its most extensive use is for mixing with cement and quartz for light colored facing in buildings. At present the low grade lime costs about one and one-half times that of cement. The sugar industry uses quite a bit of high grade lime of which about 90 percent is imported. These plantations are some 500 miles north of Lima and, due to the high freight rates which prevail here, lime production in Lima for supplying the sugar trade would not be a very profitable business. For producing high grade industrial lime and hydrated lime in the heart of the sugar district with the idea of supplying the building trade, which you might say outside of Lima is nil, you would not be able to compete with local prices.

Having become fairly well acquainted with some of the large farm managers I have proposed studing soil conditions in view of soil liming but, I am not having much success since the major crop is cotton and they feel that liming is not necessary. However, the Agricultural Schools have recently published some work along this line in regards to truck farming.

### Gypsum—Concrete Products

What has been said of lime is more or less in line with the gypsum products, the only product at present being gypsum plaster. Gypsum deposits are few and far between, the better deposits being quite some distance from Lima and also in this case the high freight rates limits activities along this line.

In line with concrete products, there is in Lima a very nicely installed concrete block plant which does a very nice business. About a year ago there was placed in operation a plant producing cement and asbestos roofing tile and other products which have also met with success. Concrete tile and concrete water pipe are other products that enjoy profitable business.

### Start Aggregates Plant

In general the aggregate situation here leaves much to desire. The coarse aggregate consists of crushed flint pebbles, crushed limestone being considered as an inferior material. A good graded natural sand is not to be found and it has been a general practice to use beach sand which is not a graded product and contains from two to three percent of sodium chloride. In view of the fact that some of the contractors are demanding better materials, I and other associates have recently started construction of a sand and crushed rock plant which will have an initial capacity of 300 tons per day. We are also studying the possibilities of a ready-mixed concrete plant for a future date, which I believe would be a very profitable and needed enterprise.

All in all Peru, along these lines can be considered as a virgin country. Within the next few years there will be a decided change and demands for better construction materials. Outside of the coast line there are no roads or other means of transportation to facilitate movement of materials at a low cost and I am sorry to say that there are no Government or Municipal regulations regarding the quality of general construction materials. Therefore, price is in general the governing factor which does not at present leave much margin for introducing good material at a reasonable price.

E. L. DRURY,

*Technical director, Compania Peruana de Cemento, Lima, Peru.

## EL PROGRESO EN EL PERU

• El Sr. E. L. Drury, director técnico de la Compañía Peruana de Cemento, Lima, Perú, en este artículo hace un resumen de las industrias de productos de piedras en el Perú, en una forma muy interesante. Hace también referencia al programa de expansión de la Compañía Peruana de Cemento, la que, a propósito, produce cemento que puede pasar fácilmente las normas de los Estados Unidos.

En sus comentarios sobre la cal, dice que ésta se emplea mayormente en la mezcla de cemento y cuarzo para revestimientos de fachadas de colores en los edificios. Ha explorado las posibilidades para la fertilización de las tierras y le complace que las escuelas agrarias estén ya trabajando en esto. La piedra caliza agrícola tiene una demanda enorme en los Estados Unidos, la que empezó con el trabajo educativo.

Es también interesante el que los contratistas estén exigiendo ya agregados de mejor calidad y que el autor esté empeñado en producir mejores productos mediante la construcción de una instalación moderna para la producción de agregados de arena y piedra. Los productores panamericanos se sorprenderán el saber hasta qué extremo han progresado las normas de calidad en los Estados Unidos.

# TYPICAL DIESEL LUBRICATION PROBLEMS:

## 5. Liner Wear

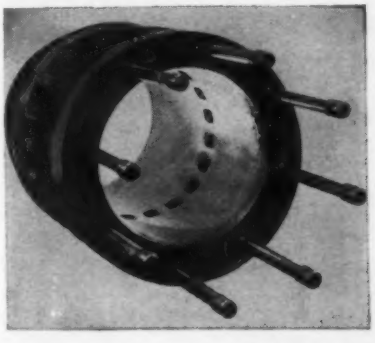
Wear on Diesel liners is commonly concentrated in the high-temperature belt near the combustion chamber. This is largely attributable to the inherent inability of most lubricating oils to "wet" hot metal surfaces.

Unlike spark ignition engines in which a partial vacuum in the combustion space during the intake stroke assists in drawing oil toward the upper compression rings, Diesels operate at or above atmospheric pressure in the combustion space which tends to drive oil away from the rings.

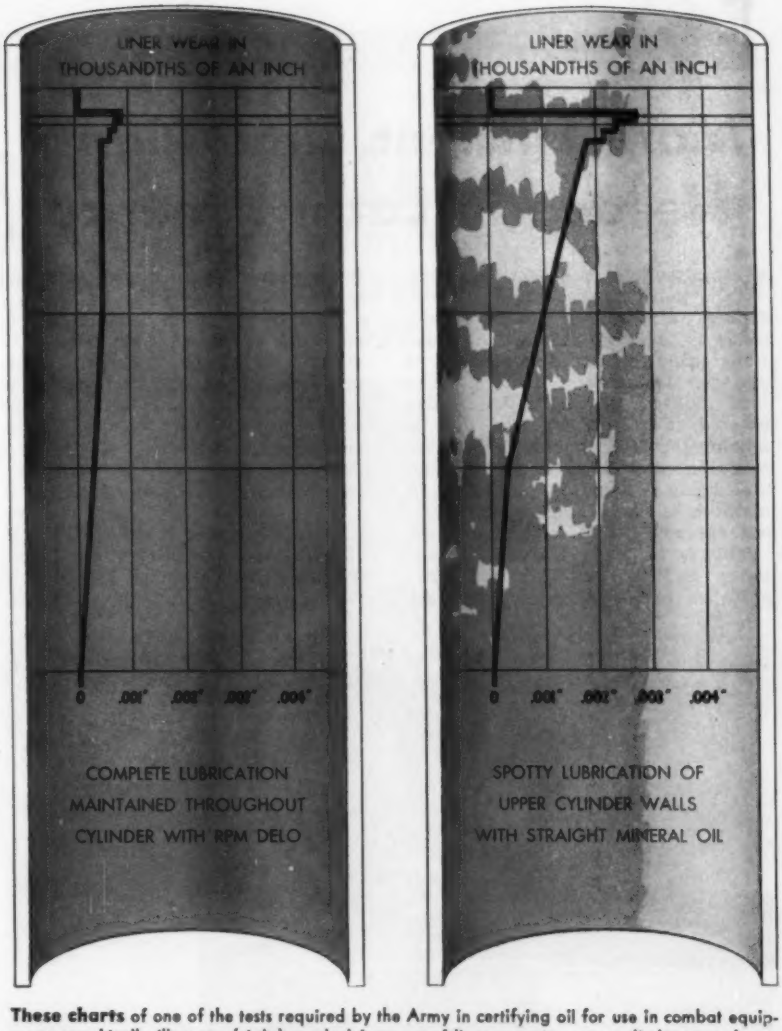
It is imperative then—to prevent relatively dry operation in the top piston ring high-temperature area—for the lubricant to have high-temperature adhesion characteristics.

To achieve this high adhesion factor under all operating conditions in RPM DELO Diesel Engine Lubricating Oil, a special compounding material was added. With this additive, RPM DELO will not run away from hot surfaces, thus preventing metal-to-metal contact on hot-running engine parts.

A typical example of the effectiveness of RPM DELO in preventing liner wear is offered by the Chicago, Rock Island and Pacific Railroad. One of its "Rocket"



**Liner from** Rock Island "Rocket" engine showing wear of only .001 in. after 157,076 miles on RPM DELO without an oil change.


LINER WEAR IN THOUSANDTHS OF AN INCH
0 .001" .002" .003" .004"
COMPLETE LUBRICATION MAINTAINED THROUGHOUT CYLINDER WITH RPM DELO
LINER WEAR IN THOUSANDTHS OF AN INCH
0 .001" .002" .003" .004"
SPOTTY LUBRICATION OF UPPER CYLINDER WALLS WITH STRAIGHT MINERAL OIL

**These charts** of one of the tests required by the Army in certifying oil for use in combat equipment, graphically illustrate (right) marked increase of liner wear in upper cylinder zone due to inability of straight mineral oil to provide full lubrication of this high-temperature area; and (left) reduction of liner wear by ability of RPM DELO to stick to these hot spots.

Diesel powered locomotives ran 157,076 miles on RPM DELO without an oil change, with liner wear of only .001 in.

Other causes of liner wear minimized by RPM DELO include:

1. Corrosion caused by carbonic and other acids at low temperatures.
2. Scuffing of liners from rocking of piston rings in worn grooves.
3. Scoring and scratching of liners due to stuck piston rings.

Reducing liner wear to a remarkable degree is but one of RPM DELO'S advantages in solving Diesel engine maintenance problems. Its other properties include: The ability of RPM DELO to eliminate ring sticking, to stop excessive deposits on rings and ports, and to prevent bearing corrosion.

RPM DELO has world-wide distribution and is marketed under the following names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Sohio RPM DELO, and Imperial RPM DELO (concentrate). Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity.

RPM DELO

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**STANDARD OF CALIFORNIA**

# More Efficient Lime Plants Needed in Latin America

THIS is an era of exact knowledge, in which guesses, empirical reasoning, are whenever possible superseded by precise mathematical equations based on thorough analysis of all the fundamental factors. The lime industry of the United States entered into this era late, but is making rapid progress, and the mysteries in the manufacture of lime are being dissipated. Production methods as well as application methods are continually being improved.

This is of great national importance, as lime itself is of vital importance, not so much as a building material in which it has substitutes as from the chemical angle in which field it has none.

The production of lime in 1943 as reported to the U. S. Bureau of Mines (the figures are far from complete for chemical lime) indicate the following distribution:

| | |
|---|---|
| Lime used in agriculture .... | 488,000 tons |
| Lime for building purposes ..... | 579,000 tons |
| Lime for chemical industries ..... | 4,075,000 tons |
| Lime for refractory purposes .....1,252,000 tons | |
| | 6,394,000 tons |

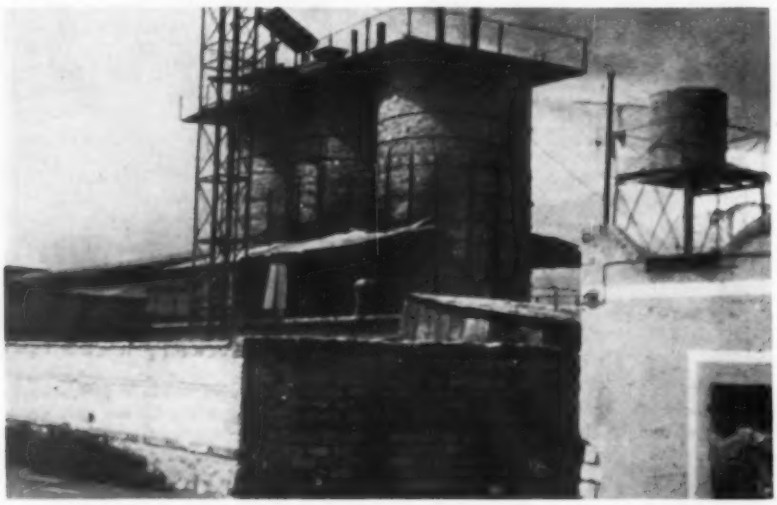
This table shows that lime used for building purposes is a relatively small portion of the total, and that its chemical uses have been predominant, which is an indication of the industrial advancement of our country.

This is not so in Latin America. In those countries, with respect to either quicklime, hydraulic lime, magnesian lime, and hydrated lime and including manufacturing methods as well as usage, the state of imperfection is somewhere at the level ours must have been 50 years ago. In all, there are not more than half a dozen plants where there was any sort of departure from the crudest of practices of manufacture. Lime is burned with artificial gas in only two plants, their mixed feed kilns are extremely crude, their direct fired kilns are equal to our worst and their pot kilns and field kilns more antiquated than the Inca ruins.

While cement plants through the southern countries are not all good cement plants, and some of them definitely poor, they all, even the poorest, are at a definitely higher plane than all of their lime plants. Lime often is so crudely made, is so indefinite in quality and is so costly, that it cannot compete with cement. It frequently is more expensive than cement.

One is inclined to wonder, with lime being such an important chemical agent in this country, that all of these many countries can get by, some of them without any chemical lime. It can only mean that they are relatively undeveloped in the chemical field.

*(Continued on page 92)*



A three-kiln lime plant, representative of the better types of plants in Mexico

Intermittent pot kiln for lime burning of a leading lime company in Guatemala

### LA INDUSTRIA DE LA CAL EN SUDAMERICA

• La cal es el asunto a que se refiere este artículo. Todos los productores de cal viva y otros productores que piensen en su manufactura, harán bien en leer este artículo, pues el Sr. Azbe valiéndose de sus muchos años de experiencia en la analización del método de fabricación, lo ha observado basándose en lo que puede y debe realizarse. El Sr. Azbe no critica los métodos panamericanos, sino que más bien está contribuyendo con sugestiones útiles y señalando las posibilidades de aumentar la eficiencia y reducir los costos.

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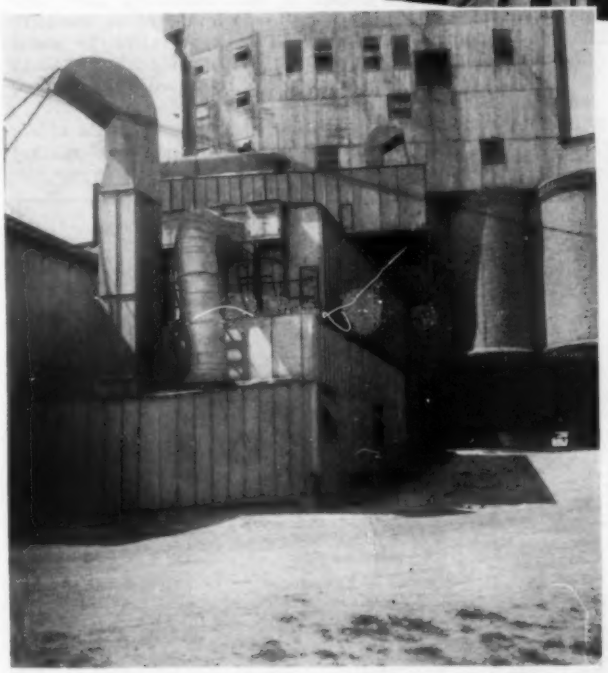
A 39,000 C.F.M. Parsons Oval Bag Dust Arrestor for collecting dust from screen house—Wedron Silica Company.

Parsons Oval Bag Dust Arrestor collecting dust from Wedron Silica Company's mill building handling 23,000 cu. ft. of air per minute.



PUT Your Dust Problem in Competent Hands . . .

PARSONS will not only give you facts and figures, but experience—years of it. Results, backed up with repeat installations, are testimony of our work. A clean, dust-free plant means greater production, not to mention the salvage value of fine dust as a filler. Send us your inquiry and watch the technique, skill and manner with which we proceed. Each dust problem is handled individually, with equipment specified on the requirements involved.

**PARSONS ENGINEERING CORPORATION**

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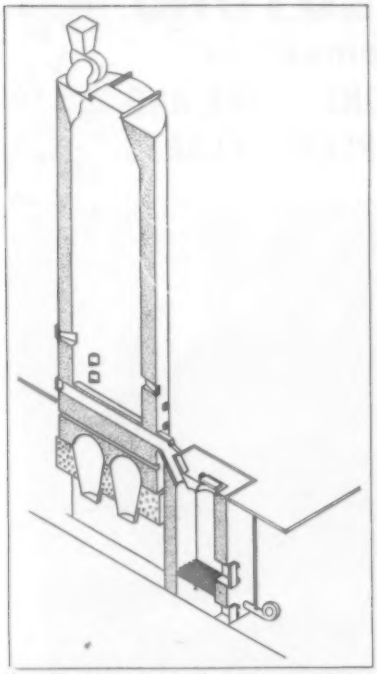
(Continued from page 90)

I have no records for Mexico but of all the South American countries, Argentina produces by far the most lime as well as the best lime. In 1941



Wood-fired lime kiln (Axbe design), equipped with center burner and gas producer; type used in Cordoba district

the amounts (only one-third chemical) were:

| | |
|---|---|
| Quicklime ... | 290,500 short tons |
| Hydraulic lime | 171,500 short tons |
| Hydrated lime | 96,000 short tons |
| | 558,000 short tons |

## Guatemala

An important exception is Guatemala, where the United Fruit Co. has placed an order for 40 tons of spray hydrate a day for every day in the year. More lime for just this purpose was used by Guatemala than for all other purposes, and more spray hydrate is made there than throughout all of South America.

## Brazil

In Brazil there are important plants where everything goes into the kiln, including high calcium, dolomitic and siliceous stone, three distinctly different kinds, and all into the same kiln. In this country, let the oxide vary but a few percent and the producer finds himself in plenty of trouble.

Of such things as available lime, rate of hydration, rate of settling, reactivity, amount of residue, nature of residue, expansion, percentage of unhydrated oxides, plasticity, fineness, pressure hydration, and so on, most of the producers know nothing at all, not because they do not have as much intelligence as anyone but just because there was no way for them to learn.

Lime sold is often very poorly burned and then is further contaminated. They do not know what they have when, for example, they mix hydraulic lime of indefinite properties with crushed brick, old mortar sand and clay. Such practices certainly would not be allowed under any existing building code in the United States. If one mixes lime with puzzolanic clay softly burned, one may obtain a satisfactory material but hard burned brick and old mortar could hardly be classed as possessing puzzolanic properties.

They have good products also, but their use is abused through the primitive codes which they have, and on account of the present extreme shortage of lime and cement and their resultant high cost.

## Mexico

Still, spottily, one sees evidences of determined progress as, for example, the plant of Anahuac Cement Co. where mortar in various admixtures will be prepared and delivered directly on the job in Mexico City. This company will be in position to turn out:

(1) Lump lime for chemical purposes.

(2) Hydrated lime.

(3) Masonry lime of 30 percent lime, 60 percent puzzolanic clay, 10 percent clinker.

(4) Puzzolanic cement of 60 percent clinker, 38 percent puzzolanic clay, 2-3 percent gypsum.

(5) Straight portland cement.

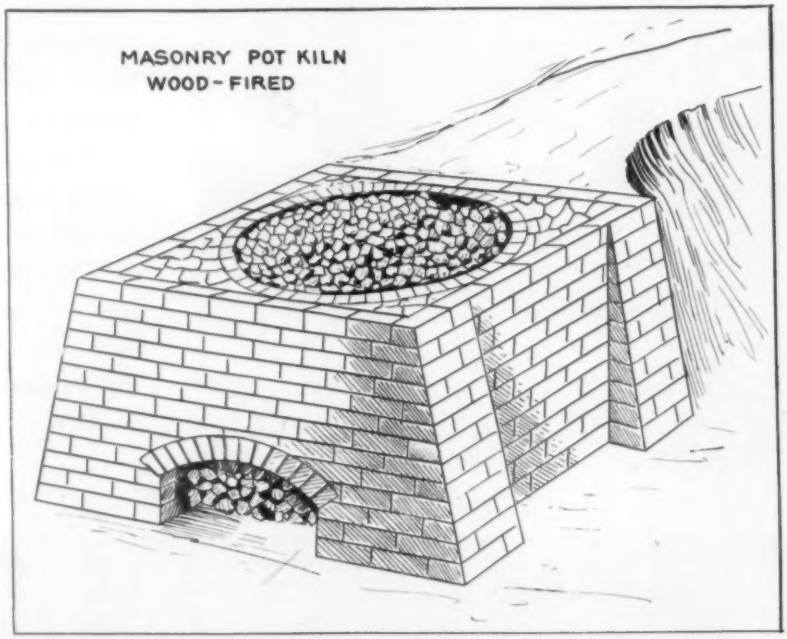
Anahuac is making a great effort to have a logically arranged, beautiful and efficient plant. When in full operation they expect to absorb 150 tons of lime a day in their processes. The installation is far more interesting than any lime or cement plant known to me, but the plant is quite definitely an exception and as far removed from most of their other plants as are the sundried brick huts of their countryside from the magnificent structures of the city.

Shown herewith is a lime plant of the type one still finds occasionally in this country. While these are fast disappearing, they would still be considered as a better type of plant south of the border. The kilns, oil fired, produce 20 tons per kiln out of 60 sq. ft. shaft, which on natural draft is good if one considers the high altitude of the Mexico City region and consequent low air density.

Fuel consumption is a bit high, but that does not matter much since oil is cheap in Mexico, costing only about 2½ cents a gallon. But plant arrangement is such that labor is high. They think labor is cheap at a dollar a day, but that is a fallacy as they use several times more labor than a systematized plant would require. Being that stone is very cheap, it was estimated that lime could be made for 10 pesos, inclusive of all charges, equivalent to about $2 a ton. It now costs from 30 to 40 pesos, with hydrated lime much higher.

To show just what the state of affairs is, cement on black market

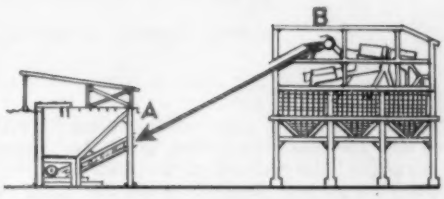
(Continued on page 100)




Typical wood-fired masonry pot kiln for manufacture of lime, common in Latin America

# 2 ways
## TO BUY A BELT CONVEYOR

**THE PROBLEM:** A New Belt Conveyor is required to handle 300 tons per hour between points A and B.




### OLD METHOD
*Doing the Job Yourself*

1. Design and Engineer the Conveyor System.

2. Select, purchase and obtain delivery from several sources, a variety of equipment.

IDLERS ----
PULLEYS -----
BEARINGS ----------
BELTING ----
MOTOR ----------
DRIVE ---
FRAMEWORK ------

3. Put together on the Job. Time consumed in

CUTTING AND DRILLING
ERECTION
ASSEMBLY
FITTING AND FUSSING
INSTRUCTING LABOR
REDESIGNING UNTIL
IT WORKS

### NEW METHOD
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2. Order from Pioneer—a Single Source of Supply and Responsibility.

3. Receive a Pioneer Belt Conveyor—complete in every detail and all ready for quick, economical erection.

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# Tremendous Potential Resources Waiting for Development

## Argentina, Brazil and Chile rock products manufacturers overcome many wartime difficulties

An example of concrete highway construction in Brazil

THE FLIGHT from Chile to Argentina was the most interesting of all as it entailed the crossing of the Andes. They are so high that the plane does not hop over them as in our Rocky Mountains but winds itself back and forth among the high peaks. Fortunately it was clear so I experienced at close range the inspiring view of the 23,098 ft. high Aconcagua, the highest on the American continent. This was September, which in this section is early Spring, so the road winding itself up to the pass was snowbound. The sight of the immense Christ of the Andes was plainly visible. Let's hope that it will continue to prevail as the sign of eternal peace, with which purpose it was set up with great effort and expense.

Argentina did not impress me at first, but I found out that they had had no rain whatsoever for seven months. Our countrysides become parched in far less time than that. First stop was at Mendoza where there is a cement plant, and then Cordoba where there is another. Cordoba is important to us because there are deposits of the best limestone and the largest lime plant in South America.

I met the Ferreyra's, Mr. and Mrs. Moyano and Mr. Giro. I saw not only their extensive lime plant and their great quarries but I also had a glimpse of what I heard so much of, "Argentinian Beef," and on the hoof. They certainly have wonderful cattle and are proud of them.

With their 21 kiln lime plant they are confronted with the problems of excessive labor and fuel costs. They burn wood, but prices of wood have skyrocketed and they now have to pay about $9 for the equivalent of one of our cords.

The fuel problem in many of the Pan-American countries is a serious one indeed except in Mexico, Venezuela and other countries that have oil of their own in plentitude. Neither Chile, Argentina nor Brazil have oil, although in all of these countries there are chances of finding extensive deposits. Some very good coal was found in Brazil.

Before the war, Argentinians exchanged beef for English coal, but while they are still sending beef, coal is not coming into the country, so they must depend on their own fuels which may be anything, even corn. At least I saw corn burned under boilers. In respect to the cement industry the following statement was prepared for me by Mr. J. Allende Posse:

"Due to scarcity of fuel oil used previously by all cement producing concerns it was necessary to resort to the use of the strangest substances, so flaxseed, bran, sunflower seed, peels of turnips and turnip seed were used. At the present time, most plants use charcoal which serves the purpose very well and large quantities are used. Cement manufacture has not increased because equipment was not available, but output has not been reduced." One cement plant tried to operate using gas made from wood, in which case there must have been something wrong as they did not continue. If their wood had been air dried, if the producer would have been amply large, if wood had been cut so as to make a solid bed possible in the producer, if the clinker cooler would have been effective in recovering sensible heat and if the arrangement would have been such that the hot air would have mixed quickly with the gas for a short hot flame, then this system also would have proven a success.

The Institute Del Cemento Portland Argentino was shown to me by its Director, Señor Juan Agustin Valle. Their complete laboratories impressed me greatly and their library also. There they had books on cement, concrete and concrete construction, journals and leaflets in all languages numbering into thousands.

In one of the illustrations we present one example of Argentinian concrete construction in the great Medical Center in Buenos Aires.

Argentina in its entirety is wealthy

*(Continued from page 96)*

Medical school center in Buenos Aires, a striking example of concrete construction

# How LeTourneau Equipment

## SPEEDS STRIPPING AND MATERIALS-HANDLING

### TRY THESE APPLICATIONS TO SAVE TIME AND MANPOWER ON YOUR WORK

**1** *Four Super C Tournapulls* stripping 85 feet of overburden for Attapulgus Clay Company, near Amsterdam, Ga., make one-mile round trips of load, haul and spread every 11 minutes. These big rubber-tired, 150 h.p. rigs, with their 15 heaped yard Carryall Scrapers travel 14.9 m.p.h. . . . give you scraper earthmoving economies over truck distances.

**2** *Two Tournatrailers*—17-yard, heaped capacity, end dump hauling units—speed long-distance hauling of rocky overburden from shovel in LaClede Christy Clay Company's pit, near Wellsville, Mo. Tournatrailers operate from same fast-moving Super C Tournapull prime mover and Power Control Unit used with Carryall Scrapers and Tournacranes . . . all three are quickly interchangeable.

**3** *Tournacrane* loads 2 to 5-ton rocks onto trucks, unloads and erects steel for new buildings, moves and assembles heavy machinery for a big western U. S. mining company. Tournacranes, with their lifting capacities up to 50,000 lbs; 8 to 21-foot reach; 20 to 40-foot lift, gives you powerful truck crane service. Will travel carrying maximum loads.

**4** *LeTourneau Carryall Scraper* strips overburden from mica deposits in Brazil. This low-cost LeTourneau Carryall Scraper earthmoving method is widely used by mining companies the world over for stripping, to build and maintain roads, stockpile materials, etc. Shown is 15 heaped yard model; other LeTourneau Carryalls range from 4 to 42 heaped yard capacities.

**5** *LeTourneau Rooter*—Here's how the Cia. Salitrera Anglo-Chilena, near Antofagasta, Chile, eliminated dangerous blasting of hard-packed nitrate. Its LeTourneau Rooter broke the stockpiled material fast, safe and at low cost; LeTourneau Dozer used on front of the same tractor shoved the broken nitrate to the loading area.

**6** *LeTourneau Dozer* loads gravel into trucks on Alcan Highway. Next time you've got a long haul job that can't wait, or you're in a remote spot inaccessible to heavy shovels, you can load trucks fast by using LeTourneau Dozers or Carryall Scrapers with easily-built loading ramps and grizzlies. Try it!

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A sample of modern concrete highway construction is this highway bordering the Atlantic ocean near Sao Paulo

**• Due to paper restrictions, several interesting articles dealing with progress in the rock products industry of Latin America had to be carried over for publication in coming issues of ROCK PRODUCTS.**

*(Continued from page 94)*

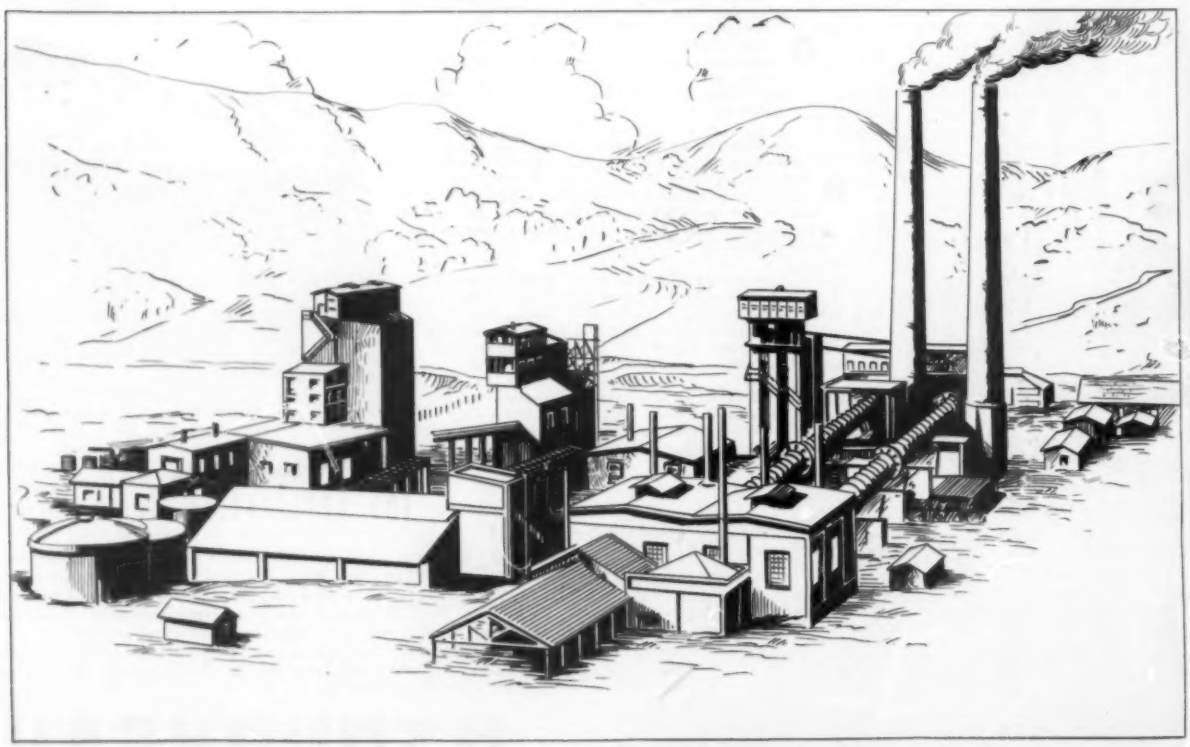
through extreme richness of its soil, its highly developed agricultural status and because it is a supplier of meat for much of the world. It is not a manufacturing country although manufacture is on the increase.

Its capital, Buenos Aires, is one of the most beautiful cities in the world. Its buildings and monuments, its parks and its boulevards are magnificent. There is much that I could say about it but space is lacking. However, I must not leave its restaurants unmentioned. Such antipasto and such soups, such wines and such meats, and such delectable vegetables were available at such favorable prices.

It is hard to evaluate the Latin American countries. It could be done by area, or by population, or by production or by consumption per inhabitant. The rating orders given below would apply a few years back to more normal conditions when production was not artificially stimulated.

As the orders stand, Argentina seems to lead, but to be completely fair other matters should be considered; for example, how difficult is the country to open. Argentina was easy to develop. Its soil, given rain, is extremely productive while by contrast Brazil is a hard country indeed to develop. Various points of Argentina are relatively easy of access while in Brazil they are most difficult. The Argentinians may be proud of their road system but to do the same in Brazil would just not be economically practicable.

| By Area | By Population | By Production | By Consumption per inhabitant |
|---|---|---|---|
| 1—Brazil | Brazil | Argentina | Argentina |
| 2—Argentina | Mexico | Brazil | Uruguay |
| 3—Mexico | Argentina | Mexico | Chile |
| 4—Bolivia | Colombia | Chile | Cuba |
| 5—Colombia | Peru | Venezuela | Brazil |
| 6—Peru | Chile | Cuba | Venezuela |
| 7—Venezuela | Cuba | Peru | Mexico |
| 8—Chile | Venezuela | Uruguay | Peru |



Two-kiln cement plant of Fabrica Em Santa Helena, Sorocaba, Brazil

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# A. I. M. M. E. Meeting in Los Angeles

## New mining methods, flash drying and calcining, and spectro-chemical analysis discussed at Industrial Minerals Division meetings

By WALTER B. LENHART

MANY excellent and timely papers were presented before the Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers at the Los Angeles meeting in the Ambassador Hotel, October 19 and 20. It was held under the auspices of the Southern California Division of the A.I.M.M.E.

HARRY V. WELCH and E. O. SLATER, co-chairmen, presided at the first day's session. The first paper, prepared by Oliver C. Ralston, United States Bureau of Mines and A. George Stern of the Westvaco Chlorine Products Corporation, was read by Mr. Stern. Its subject was, "Fluorescent Minerals Used in Lighting and Elsewhere."

Although the quantity of minerals (in tons) that are used for fluorescent purposes is small and probably will continue to be that way for some time the significant feature is the extreme purity of the required minerals. It was pointed out that traces of contaminating materials as low as one part in ten million may cause rejection of the ingredient.

When certain rocks and minerals are subjected to the rays of the fluoroscope or so called "black light," these minerals give off different colored lights or are said to "glow." In the non-metallic field the most common of these minerals is calcite and some forms of limestone. Not all limestone or calcite will fluoresce and when they do they do not all give the same colored light. Hence in any given limestone quarry it might be theoretically possible that certain stratifications of limestone would fluoresce and others would not, thus giving a practical and easy means of sorting limestones that had different physical characteristics but which to the naked eye might look exactly alike. This might be an important step in the preparation of some chemical limes.

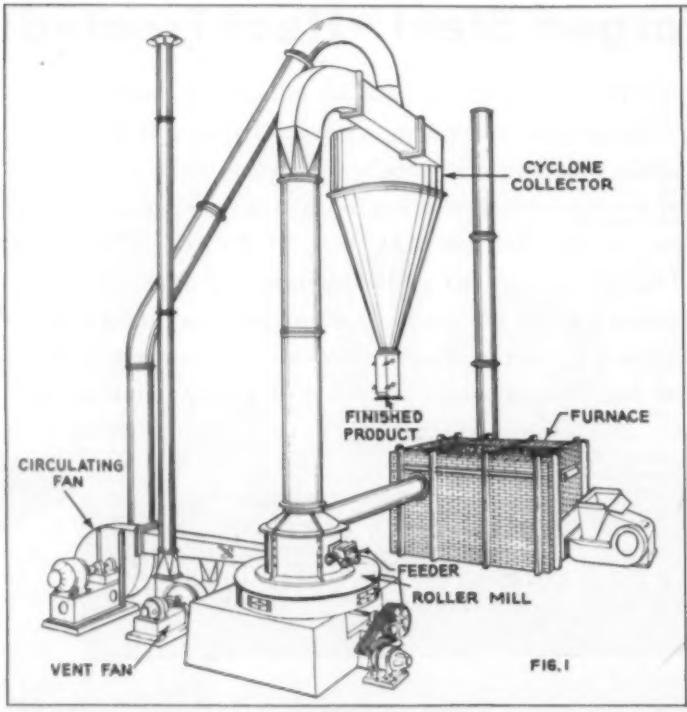
### Flash Drying and Calcining

The second paper, "Flash Drying and Calcining as Developed from Mill Drying," was presented by WILLIAM B. SENSEMAN, western manager of the Raymond Pulverizing Division, Combustion Engineering Corporation. This is a subject with very broad applications in the non-metallic field and it is surprising to note that to many of those in attendance its possibilities were so widely appreciated. Mr. Senseman, by means of a series of slides, gave a descriptive outline of the growth of the use of Raymond drying equipment. These slides showed the many combinations possible, some simple and others more complicated.

Mr. Senseman pointed out that in the non-metallic mineral industry, dry grinding is customary procedure. About 20 years ago hot gas was added to the mill system for the purpose of removing moisture. Two typical installations of dry grinding and application of hot gas displayed by the slides are shown, herewith.

Fig. 1 shows a typical air-separation mill extensively used for pulverizing a great variety of non-metallic minerals. Pulverized material is removed by the air stream and trapped in the cyclone collector. Air

(Continued on page 130)



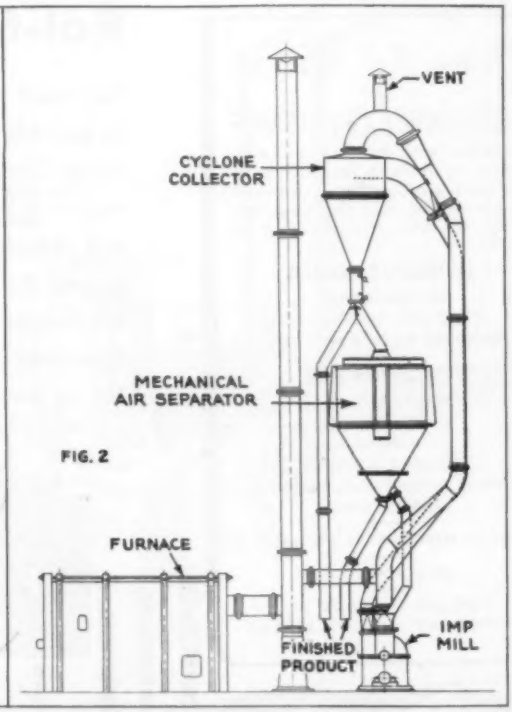




Fig. 1: Air-separation mill with the application of hot gas to the system. Fig. 2: Mill drying equipment which will handle feed regardless of moisture

# SPEEDY REDUCTION

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HAMMER ADJUSTMENTS OVERCOME WEAR—Discs are arranged so that the hammers can be set out as they wear on the end.

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PATENT CRUSHERS GRINDERS SHREDDERS

## Lime in Latin America

*(Continued from page 92)*

sells for 155 pesos a ton; steel, mill cut, 1500 pesos; gray cast iron castings 480 pesos a ton of 2200 lbs. A Mexican peso has a value of about 20 cents.

There is no other country where lime could be made as cheap, since fuel is the only expensive item. At the leading lime plant in Guatemala, fuel per ton of lime produced in intermittent pot kilns of the type illustrated costs $5.54 a ton in our equivalent. At the Ferreyra plant in Argentina it costs $5.00, and at the Carbide Co. plant in Chile they obtain a ratio of 2.4 to one with coal costing $10.00 per ton. In every one of these cases fuel consumption should be only half of what it is, but their kilns are very primitive and they do not have the technical men to modify them. The war suddenly increased the fuel prices and they are now up against it.

Fuel consumption will vary with kiln efficiency and with the nature of the lime. Hand-fired kilns have low efficiency, gas-fired kilns a higher efficiency and mixed fed kilns, if suitable coke (not petroleum coke) is available, are still more efficient. A high calcium lime will require the most heat for calcination, dolomitic lime about 25 percent less and hydraulic lime still less.

It thus can be seen that no specific all-embracing figure can be given. But, in general, we may say with high calcium lime a mixed feed kiln with good coke should have a fuel ratio of 1.0 to 6 lime or better. But it must be coke from coal, not petroleum coke, not coal, not wood, as they all have large portions of heat in volatile matter which virtually all will go to waste with these kilns.

If the kiln is direct fired with good coal, the fuel ratio may be 3½ to 1, and in exceptional cases of great firing care 4 to 1, but ordinarily will be below 3 to 1. If coal is first gasified in suitable producers the fuel ratio will be 5½ to 6 of lime to one of coal. With oil, 40 to 45 gallons is good, and less than 40 is possible, although often more than 60 gal. is used. With non-resinous air dried wood, if the wood is direct fired, a ratio of one to one will be obtained, but if the wood is gasified a three to one ratio is possible

This subject of wood burning is extremely important to much of this world. The logical fuel in Argentina and Brazil is wood, and so it would be desirable that the claim of a ratio of 3 to 1 be further qualified.

### Argentina

This has been proven out in the Argentinian lime producing district of Cordoba where some of the kilns were converted to the Azbe system of wood application to lime kilns. An imperfect application in one plant reduced the fuel from a ratio of 1 to 1 to the much better ratio of 1 to .7 with plenty evidences remaining that still better results are possible.

In the other plant, having a different stone of lower CaO content, they reduced the fuel ratio from 1 to .8 down to an average of 1 to .4 and at times for a whole week's operation down to 1 to .35, with plenty of evidence that a still lower consumption is possible. However, even as it is, this latter is a reduction by half, which means considerable when that half represents $2.50 per ton of lime, particularly so when converted into the purchasing power of the Argentinian peso.

Much of the lime made is hydraulic lime. Most of it is made in mixed feed kilns of crude, natural draft type fired with any sort of fuel they may have available at the present. While the fuel should be good coke, it most often now is charcoal or petroleum coke or even wood. The reason for using wood is impossible for me to understand.

Kiln capacity is low, fuel efficiency is poor, the kilns show a yellow smoke, which is a very bad sign, and they often fire in the top of the kiln which has the same effect. Lime drawn is dumped on the shed floor, sprinkled with water and is allowed to hydrate as best it can for 20 hr.

*(Continued on page 102)*

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THE POSITIVE FEED CRUSHER

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Non-Clog
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Positive mechanical feed is an exclusive, patented feature of Dixie Non-Clog Hammermills. Differing in this respect from all other crushers, the DIXIE breaker plate, instead of being stationary, is a continuously moving belt of manganese steel links. Clogging and slowing down are eliminated by the mechanical feed afforded. No manual pushing of material is needed. Even the most plastic, wet, clayey material will not slow production or clog hammers.

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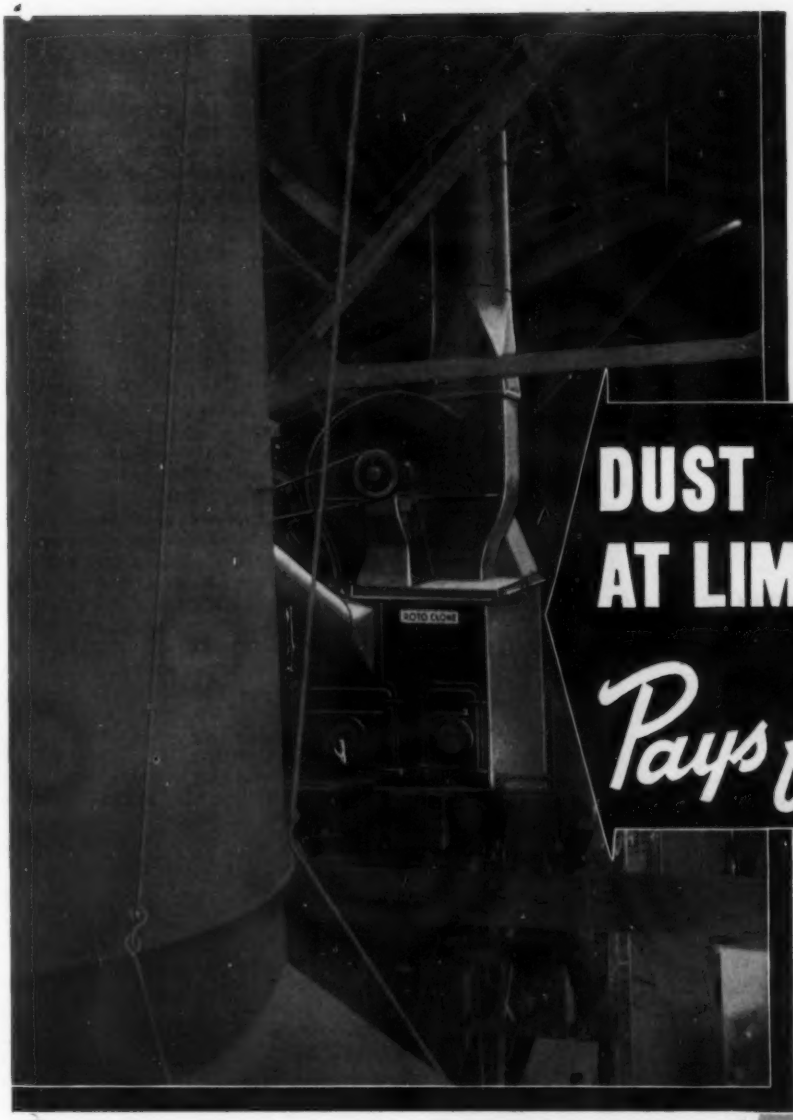

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BULLETIN NO. 277

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- Saves Roof Cleaning
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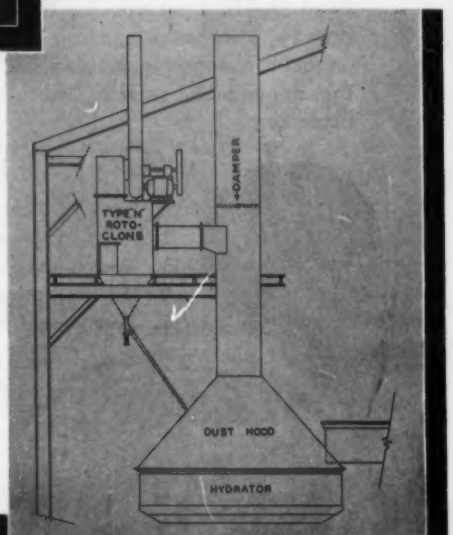
The Type N ROTO-CLONE cleans by means of a water curtain induced by the flow of air. There are no moving parts or narrow passages to be obstructed by lime dust deposits. Capacities from 1,000 to 25,000 cfm. Complete information sent promptly on request.

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# ROTO-CLONE
## FOR ROCK PRODUCT DUST CONTROL

(Continued from page 100)

when it is considered ready for mill.

There is such a shortage of materials that in Argentina they are trying about everything in the way of lime and fuel. They take hydrate from acetylene generators, mix it with limestone sand and clay, form this into 12-in. x 4-in. plates and burn these in mixed feed kilns into fairly good hydraulic lime.

At present Argentina is experimenting with ground sea shells mixed with hydrated lime, compressed into large briquettes, which after drying for eight days are charged into kilns.

# Views on Chile

PERU, BOLIVIA, and northern Chile are mainly mining countries, producing gold and silver, copper and tin, borax, nitrates, etc. They possess some of the world's driest regions, some where they may get possibly a quarter of an inch of rain a year from sort of a heavy dew, some where it has not rained for 40 years. From the peaks of the first Andean range to the coast it is only green in a narrow strip, where a river comes down from the high valleys. But in approaching Santiago all of this changes and it is a grand relief to again see cultivated plains and to be coming to this beautiful and ancient seat of civilization.

For one who has traveled the Mediterranean States, Santiago hardly seems American but rather a city transplanted from Europe. It is a busy place, one may say, too, a boiling place and does remind one of the early days when the New Deal was in its greatest social experimental mood. There is a great tug between employe and employer from which, as appeared to me, one completely detached, that both lose and that after the International Trade Routes will again be fully open Chile as a whole will be the sufferer.

I arrived in Chile during Independence celebrations. On one of the days I saw the army in parade until late into the night and then I imagined myself transplanted to Unter den Linden. It is a German-trained army, German-like uniforms, the precise motion of German soldiers, but that all does not in any manner mean that their sympathies are German.

Let's hope they never will have any use for their army. For myself I see no reason for it and the money would better be applied to aggrandizement of Chile industrially, commercially, to the building of roads which this long narrow strip of country needs.

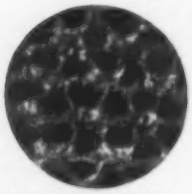
In Chile I made many friends. Among them was Mr. Luis Monge Mira, an exceedingly well posted engineer and close student of American rock products practices, and author of the book on lime "Cal Viva." We may expect an article from Mr. Mira on cement developments in Chile and Paraguay at an early date.

### Need Soil Liming Materials

Mr. Alberto Del Carpio Z. of the International Machinery Co., was also very helpful. Without such help my trip would have been wasted but they plunged me immediately in contact with industry. Thus only after a couple of days I had an opportunity to give a talk before the Chilean Engineering Society, an overflow meeting. Although most of the talk was through a very able interpreter I still felt as if I was at home and among friends as when appearing before our National Lime Association. And, incidentally, I was before them as the delegate from our N.L.A. with formal greetings and introductions from Mr. Walter Stauffer. My mind is still crystalizing on this Santiago visit. Among the many was the Chilean Minister of Economy who agreed so strongly about the necessity of soil conditioning.

They are short of wheat, of food-

Pacemaker transmission belting is well-known . . . it has a string of performance records behind it "as long as your arm". It is the great all-purpose belt that has been building records for many years on all types of drives . . . in peace and war production. Even with war imposed changes in materials it has continued to give the dependable service that has won it a place of leadership.



Note bonding of rubber. Separation of plies during operation is practically impossible.

When you buy Pacemaker you get . . .

1. Long service.
2. Practically no stretch or slippage.
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4. No separation of plies.
5. Exceptional flexibility.

On your next order for transmission belting specify *Pacemaker*.

CINCINNATI
RUBBER MANUFACTURING CO.
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## LAS PERSPECTIVAS EN CHILE

• El Sr. Azbe da en este artículo algunas cifras sobre la utilización de los materiales usados en la fertilización de tierras en los Estados Unidos, en contraste con el uso limitado en Chile. Los productores de materiales fertilizantes chilenos, como cal viva, así como también piedra caliza rica en calcio, deberían pensar en este gran mercado, pues, evidentemente, las tierras del país son subnormales.

El Sr. Azbe describe también varias fábricas de cemento y diserta ampliamente sobre los costos de los jornales y el combustible, haciendo al mismo tiempo interesantes comentarios sobre los costos de fabricación de la cal. Más aún, se vale de su experiencia como ingeniero de fábrica de cal para sugerir las economías que podrían efectuarse en estas mismas operaciones mediante el empleo del método de fabricación correcto.

stuffs generally. Their crop yield is going down, and soils are being exhausted. The ph. of some is 4½ to 5 when for wheat it should be 6 to 7 and for alfalfa 7 to 8. For sweetening of soil they use probably 80,000 tons of limestone when a million should be used to hold the fertility and three million are needed to build it up.

By contrast, and I am putting this down for their benefit, in U. S. during this past year of 1943 the liming materials used were the equivalent of 60,000 lb. of CaO per million of inhabitatnts while in Chile it was only 6000 lb. or just one-tenth. R. Zorrilla and S. Baranovsky in an article in a later issue will explain why more was not used. While for us it is much easier to obtain, deliver and broadcast, all at a much lower cost, we also are not in such desperate need.

### Cement and Lime Plants

In Santiago I encountered what probably is the smallest rotary lime kiln in commercial operation. It is 30 feet long and three feet in outside diameter, using seashells, fired with oil and producing three tons of lime a day.

The Melon cement plant is quite some institution. It has three 10- x 170-ft. Traylor kilns with rotary coolers, two old Power & Mining Machinery 10- x 260-ft. kilns, and two 9-ft. 6-in. x 8-ft. x 300-ft. kilns, recently installed. These kilns came

*(Continued on page 105)*


# *A Fitting Example* for Suction Dredge Operators . . .

Hydraulic dredges operating with high pipe line velocities and pressures, and handling abrasive solids intermixed with boulders, should be equipped with Amsco manganese steel pipe line fittings if maximum ultimate economy is to be obtained.

The use of this metal, with its strength, ductility and work-hardening quality, precludes fracture from shock, gives long wearing life against abrasion and obviates bursting when the parts are worn thin.

Moreover, Amsco design—resulting from long and varied experience in serving dredge operators—affords such features as proper radii for long sweep elbows, correct metal thicknesses and other apparently small but important details.

Standard Amsco fittings include elbows, pipe, nipples, reducers, expansion joints, flanges, flap valves and the like in sizes from 3″ to 18″. Larger fittings and such items as tees, "Y" 's and laterals are supplied to fit individual requirements.

The pictures show a shipment of Amsco manganese steel fittings to U. S. Engineers for a river dredge having 20″ diameter hull piping. The carload in Picture C-621 consisted of 25 tons, or 38 pieces of various types, from plain straight pipe to special reverse bends and bulkhead pieces. Picture C-621E gives a close-up of typical pipe and fittings on this order.

Suction dredge operators who follow the example of their Uncle Sam will find that Amsco pipe line fittings are definitely the most economical in service life, steady production and maintenance cost.

•

Send for Bulletin No. 844-D — "Manganese Steel for All Dredging Purposes."

C-621 A carload of Amsco manganese steel dredge pipe line fittings for the U. S. Engineers.

C-621E Pipe and fittings for suction dredge.

**Send for Bulletin 941-W on Amsco Conservation Welding Rods**

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

AMERICAN Brake Shoe COMPANY

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OFFICES IN PRINCIPAL CITIES

# From Uruguay to Brazil

SAO PAULO, Brazil, is the most active city of all of South America. They call it the Chicago of South America and with good reason although the skyscrapers put one in mind of New York also. It particularly was active in Votorantine about which a special article is to be presented and which is indicative of the awakening of Brazil's dormant powers.

A trip was made by narrow gauge railroad to Sorocala where the cement plant is. The return was by auto operated with charcoal gas. On the way we ran out of gas, so the operator just shook one more bag of charcoal into the gas producer. It gets you there all right but you have to be sort of a combustion engineer fiddling with adjustments continually, and I noticed no women drivers on gasogen equipped cars.

Rio de Janeiro, or just "Rio," I shall never forget. While Buenos Aires was made beautiful by man, Rio was made beautiful by nature.

Technical Director Merz of Magnesita, Bello Horizonte, Brazil

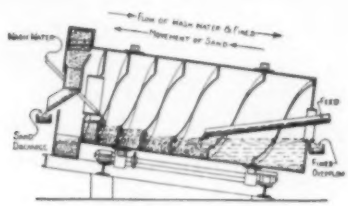
Anything that we could say in the space allowed would be so little that it is best we say nothing, so on to Bello Horizonte in the State of Minas Gerais, another industrial hub in rapid development. We will hear more of it as Technical Director Merz of Magnesita is preparing a special article for publication in a later issue of ROCK PRODUCTS. Brazil has enormous deposits of magnesite, the greatest in the world and it has enormous deposits of so many other minerals but unfortunately it lacks fuels. Recently, however, it seems that large deposits of very good coal were discovered and, with that available, Brazil with its 45 million people will go places even faster than it now is doing. I travelled up the coast to other places and even stopped at the head of the Amazon.

The trip was wonderful and the difficulties have been forgotten. There will always be a soft spot in my heart for the South American people. They are different but they are wonderful. In time I do hope that they will realize more and more the friends they have in the North. We may be blunt, we may be even rude and we may appear to be profit anxious, but in spite of all that, in no other nation does Latin America have the friend it possesses in the United States of America.

## Simplified Spanish

TO CREATE a better understanding between the peoples of North America and South America, the Pan American Society, Quito, Ecuador has prepared a pamphlet for free distribution which describes the words in Spanish and English which are essentially the same and the endings to English words which will convert them to Spanish. M. A. Alvarez is secretary of the Society, and will be glad to send pamphlets without cost to those who request them.


# HARDINGE COUNTER-CURRENT CLASSIFIER



A slowly rotating drum on the inner surface of which is located a spiral flight attached to and revolving with the drum.

HOW IT WORKS

The material to be classified is fed in at one end and as the Classifier rotates the coarse particles settle out and are moved to the sand discharge end. The fines with the wash-water overflow at the opposite end.

The material in the Classifier is rolled, not scraped: therefore, the Classifier will start under full load no matter how long it has been shut down.

Low maintenance is due to the rolling action and extreme simplicity.

USES

Classifying and sizing.
Counter-current washing.
Sand and gravel washing.

# HARDINGE

COMPANY, INCORPORATED, YORK, PENNA.

NEW YORK CHICAGO SAN FRANCISCO TORONTO

CC-3 Rock Products

## Chilean Views

*(Continued from page 103)*

from the old Edison plant in New Jersey. At present they produce 355,000 tons a year and they will soon produce an additional 125,000, for a total of 480,000 tons. They use natural cement rock analyzing 73 percent to 84 percent $CaCO_3$.

The Juan Soldado plant will go in operation in 1945 with 200,000 tons capacity and there are two other plants projected for later installation. Demand is continually increasing and there is a great shortage of cement here as well as everywhere else.

There are frequent earthquakes and a severe one occurs about every 10 years, so reinforced concrete construction is necessary.

Coal is the fuel. It is poor and expensive, costing about $13 to $16 a ton. It is high in moisture and high in ash with a heat value of about 9700 B.t.u. on a received basis.

Cement sells for 74 cents per paper bag of 42½ kilos. Imported cement sells for $1.80. Lime costs more than cement and it is poor lime at that.

Common labor is $1.24 per day. Union labor gets about $1.90 but is troublesome, unwieldy and not at all in favor of the efficient methods which are so necessary. There is plenty of union trouble.

There is a Kunze kiln at what is probably the world's largest sugar refinery, producing 300,000 tons of sugar a year. They are well pleased with it. It produces 20 tons of lime a day. Fuel is bagasse, of which there is an unlimited supply.

### High Fuel Costs

The Fabrica Nacional de Carbura (Carbide) has three direct coal-fired Keystone kilns each producing 8 tons. They are building another.

Lime costs them about $24 to manufacture, which is the highest figure I know of for any plant anywhere in the world. Stone has to be brought a long distance and is very expensive, and coal is expensive, costing $16 a ton. Fuel efficiency is poor and labor cost is high. The kiln produces lime of only 78 percent to 80 percent CaO, from a limestone of 96 percent $CaCO_3$, making it difficult for the electric furnace later.

There are many mixed feed kilns. In some, both coke and wood is used for fuel, but wood in a mixed feed kiln can do little good. It is mostly volatile which escapes in the upper preheating section of the kiln. With lime of 45 percent free CaO, 100 Kg. of coke and 250 Kg. of wood are used while, if conditions would be right, for such a low CaO lime, just coke without wood should be able to do the job. But this condition also will change because they have men who will insist on the change and they will have to change.

. . . for

*Low Cost Water*

• The "Certified" tag on every Carver Pump is your assurance of top performance on the job. It's the kind of performance that means more water at less cost. Each pump is thoroughly tested so that you will get full capacity right from the start and keep on getting it, on tough jobs or easy ones, with less time out for maintenance and repairs.

Available from 1½" to 10", 5,000 to 200,000 gallons per hour. For details, see your nearby Carver distributor or write direct.

**THE CARVER PUMP CO.** Muscatine, Iowa

# Argentine Highways

By J. ALLENDE POSSE

It is only very recently that man has been able to fly. Up to the first third of this contury he could only sort of crawl over the earth. He devoted much of his energies in the building of roads, most of them primitive, using in their construction the natural soil and its components, clay, sand and rock. Later, with the employment of better methods better roads were built but which still were only adequate for light traffic, in sections of low population density where more expensive roads could not be justified economically.

But as soon as the automobile appeared and traffic reached a few hundred cars a day, it became necessary to build superior types of roads using stone, sand and cement. Magazines specializing in these subjects, are directly concerned with the advancement of highways and, through this, Rock Products has contributed greatly to the extraordinary development of the Argentinian road system of the past 12 years.

In the year of 1931, at the beginning of the progressive government led by the President, General Austin P. Justis, a law was passed that enabled the construction of a vast highway system for which funds were assured by a tax amounting to 5 cents per litre of gasoline. It also created the necessary bodies to manage these funds, as well as others to do the necessary technical work. Each of the 14 states that form the country, voted complementary laws, providing still other funds and creating technical bodies for their management.

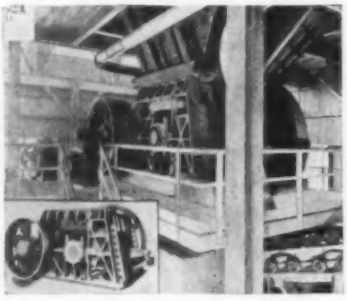
Argentina has received wonderful cars from foreign lands. In the early 1920's, there were 50,000, mostly of European make, while in 1929 there were 436,000 nearly all manufactured in the States. Due to lack of roads they only could run in the cities, or during dry weather on the earth roads of our plains. Later, due to the world depression, the number of cars decreased, but soon they increased again to a total of 450,000. In the year 1921 the gasoline consumption was 100 million litres, in 1930 it reached 900 million, and later reached a record of 1400 millions.

## Plan Extensive Road System

When legislation was put in effect I had the privilege of becoming entrusted with its application, in which I was assisted by a group of distinguished citizens. We started work with great enthusiasm, at first on extensive basic studies. The plan, as the map shows (page 108) was to have 37,000 miles of primary roads and in addition a feeder system of 312,000 miles of secondary or local roads. The primary system was in charge of the federal government, the rest to be built and maintained by the governments of the 14 states. But to this burden placed on us, which I may say we were glad to carry, was added another and if anything a more difficult one.

It was necessary for us to prepare the technical men; we had very few engineers possessing a specialized knowledge in these subjects, but six years later, our Bureau of Public Roads had 300 carefully trained engineers and a great number of topographers, draftsmen, calculators, and also specialized lawyers, while each state had similar although smaller aggregations of talent. These specialists had to be trained and therefore Mr. Thomas H. McDonald, head of the Bureau of Public Roads of the United States, was appealed to for cooperation and he gave it generously. First, two qualified engineers, Noel J. Anderson and Henry Aron were sent to Argentina, followed


"PENNSYLVANIA"



*STEELBUILT* Single Rolls, in 9 sizes, assure uninterrupted, low cost primary crushing for large, medium and small Cement, Lime and Gypsum Plants.

"Pennsylvania" *REVERSIBLE* Hammermills

in 15 sizes, prepare these primary products to required specifications with higher efficiency and lower operating cost than previously available.

A number of these "Pennsylvania" *REVERSIBLES* are rendering efficient service in South America.

A large "Pennsylvania" Single Roll will soon be reducing Steam Shovel Rock for secondary crushing in a modern South American Cement Plant.

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*STEELBUILT* CRUSHERS

## J. ALLENDE POSSE

**• THE AUTHOR of this article is a man of great influence in Argentina, and has an engineering background. He has extensive directorial and financial interests such as cement plants at Mendoza, Cordoba and Pipinas, also lime plants at El Sauce and at Pipinas. Mr. Azbe has had business relations with Mr. Posse over several years and together they have proved that fuel consumption of typical South American lime kilns could be reduced by half, from the usual ratio of 800 to 1000 kilos of air dried wood per 1000 kilos of lime down to only half this figure or less.**

later by other North American experts and all contributed good advice and wise instructions.

In turn, accompanied by selected engineers, I visited the central and eastern part of the United States, where we traveled widely. In 1936 we published a book of 500 pages with a complete report of our trip which was followed by still other similar publications. Later I sent other engineers to the States to enter the matter practically and actually learn the art of road building so highly developed in this wonderful country.

In addition, many technical pamphlets were translated and we were also kindly authorized to translate the Magazine *Public Roads*, published in Washington, which doubtless contains the acme of technical teaching on this subject. Many other books and magazines like ROCK PRODUCTS taught our engineers to become experts and so a school of high intellectual value was founded, that proved of great value and was taken advantage of by all our universities and technical schools.

The result is that Argentina can show a great job executed in a relatively few years, a system of more than 300,000 miles of roads opened to traffic over all its territory. No part is unexplored, any corner is accessible at any time except some zones in the Andes at time of heavy snow fall. Due to this highway system the country is accessible and wherever the land is not yet worked,


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☒ NAYLOR for high pressure hydraulic lines

☒ NAYLOR for high and low pressure air lines

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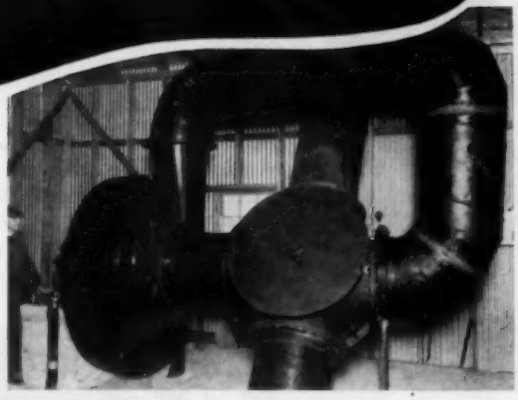

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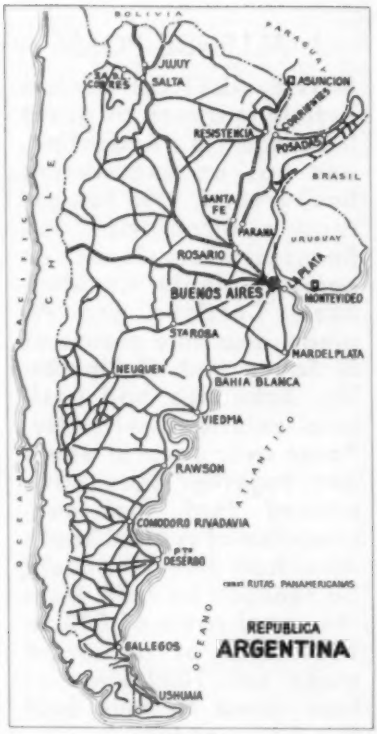
it is open to the natural resources now known, or still unknown, when occasion demands and capital becomes available.

### Pan American System

Particular attention has been devoted to the Pan American Highway System, which joins us with all parts of America, north and south up to Alaska. It can be said that in Agentina it is practically finished and although all paving is not completed all-weather travel is assured. In the issues of March, April and June, 1939, of the *Bulletin of Pan American Union* which fosters friendly relations among our countries, I had opportunity to comment specially on these roads. Lately the theme has been treated thoroughly by the Automotive Club Argentinus, whose President, Mr. Anesi, made a trip in 1941 through South America and published on his return a book entitled "Caracas-Buenos Aires," in which he treats the subject with utmost care, giving complete information and many favorable forecasts on this so-important road system. The Club decided to promote an automobile race from Caracas, Venezuela, to Buenos Aires, preparatory to another competition, from New York to Buenos Aires, possibly for the year 1945. Unhappily the serious international events have disturbed that friendly program.

In the following I will refer to some special undertakings which are of universal interest, either because of their beauty, their magnitude, or their technical difficulties of construction.




Highway system of Argentina

The new Avenue General Pae surrounding the city of Buenos Aires has a minimum width of 100 meters with the separated concrete paved express traffic bands which in their initial length extend 24 km. without crossing any railways, roads or streets. Architects and landscape men of highest talent were freely used to assure the highest aesthetic standard, so this avenue now is classified as one of the most beautiful in the world.

Another example of great interest with which I was connected is the high viaduct for access to the city of Buenos Aires which crosses the "Riachnels" at the city's boundaries.

## Mexico's Cement

*(Continued from page 75)*

petition, nonexistent at present, and it is then that we will acquaint ourselves with such niceties as centrifugal air separators in closed circuit and dustless cement plants. We are well prepared in the way of accumulated reserves for such replacements.

Limestone is quite abundant, as well as fuel oil, and our labor costs are ridiculously low as compared to those for other countries of the Western Hemisphere, so there is no reason why our cement industry should not eventually bid for world markets, adding its own small bit towards a better standard of living for the people of the World.


# It's an engineering fact . . .

**This 9" MULTICLONE TUBE has 8 times the dust separating power of a 6 ft. cyclone chamber!**

IN RECOVERING dusts, fly ash and other suspended particles from gases, it is a basic engineering law that the separating efficiency of a cyclonic collector tube *increases* as the tube diameter *decreases*. For example, with the same power expenditure per cubic foot of gas treated, the separating force acting upon a given-sized particle is *8 times greater* in a 9 in. MULTICLONE tube than in a standard 6 ft. cyclone chamber . . . *8 times greater cleansing power to throw out extremely fine as well as coarse particles.* This is why the MULTICLONE is so highly efficient in recovering ALL types of suspensions, even those of low micron size!

The MULTICLONE provides the high recovery efficiencies of *small* diameter tubes because this construction is made practical by the simplified inlet of the *vane* tube design—an exclusive MULTICLONE development. Yet this is just one of *many* advanced features incorporated in the MULTICLONE. Send for Bulletin that describes others!

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*36 years of specialization in recovering suspensions —starting with the first commercial application of* COTTRELL *Electrical Precipitation—is behind the* MULTICLONE. *Let this experience assist you in the efficient solution of your particular recovery problem!*

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## Tennessee Phosphate

*(Continued from page 61)*

tedious at best, is slowed up to a snail's pace if the pit is too deep for the mucker to pitch out from. To solve this and speed up mucking, as hand mining is called, Hoover and Mason Phosphate Co. developed a method called "panning" which has been in use for many years. A three sided heavy sheet iron "pan" about four feet square and three feet deep with dumping trip is used in place of the dragline bucket. In the early days a cantilever crane was used to handle the pan into and out of the cutter holes and to transfer the load to the tram cars. The cantilever arm would merely poise the pan over the hole and lower it vertically by means of the usual hoist arrangement, to the level of the mucking crew, which would rest the dump tripper from the pan's previous discharge, and refill it, whereupon the loaded pan would be hoisted up, swung over an empty tram and dumped by remote action at the operator cab. The cantilever has long since passed into the limbo of remembered things but the pans* are still used with the draglines.

### Dragline Operation

A dragline is operated with a crew of two men, the operator and the oiler. The operator, for numerous reasons already mentioned is one of the highest paid wage earners in the plant, rating almost a third more than a dinkey "skinner," but nevertheless the average cost of transportation is greater than that of mining. Many factors operate to vary the cost of both between wide limits as pointed out under "Exploration," so it is difficult to present average cost figures; however, the following are representative, exclusive of supervision and overhead:

Mining—34c/ton on washed, dried basis.

Transportation—41c/ton on washed dried basis.

Total—75c†/ton on washed, dried basis.

The largest single item of maintenance on a dragline is rope, both digging and hoisting lines requiring frequent replacement and the boom rope occasional replacement. A popular specification is that of 7/8-in., 6 x 19 preformed, flattened strand, plow steel, wire rope center, wire rope in Leschen Hercules, Roebling, Wickwire Spencer, Columbia, American Chain, and other brands.

An interesting comparison comes to mind between the maintenance cost of a large walker-equipped dragline and a very modern, but smaller one equipped with crawler treads.

*(Continued on page 110)*

*Recent difficulties in obtaining common labor have made it necessary to suspend such operations.

†These costs are constantly changing upward due to increasing labor rates.


# Morris PUMPS Plus Morris SERVICE

**Maintain Uninterrupted Output of Essential Materials**

TO FURNISH on time hard metal housing liners—Morris Flintmetal—as effective substitutes for unobtainable pure gum rubber covering and unsatisfactory synthetic rubber, has been a highly necessary wartime service for the Pennsylvania Glass Sand Corporation.

"These particular liners are being used in the exclusive production of material for the aircraft industry," writes E. O. Banker, Purchasing Agent—"hence our desire to be sure that the pumps do not fail at any time. We greatly appreciate the special efforts you have made on various occasions to rush the liners to us. Thanks for your splendid cooperation."

★ Glass sand slurry, one of the sharpest and most abrasive commercial elements, is handled at 170 GPM by 3-inch Morris Slurry Pumps at the plants of Pennsylvania Glass Sand Corporation, Lewistown, Pa. A 30 to 40 per cent silica sand slurry, 1.35 specific gravity, is pumped from the bottom of a Dorr thickener into the plant for further processing. The static discharge head is 72 feet . . . *but the actual dynamic head in this system is estimated at 152 feet.* Here you have that combination of highly abrasive material and exceptionally high head that results in unusually severe service . . . just the sort of service, however, that Morris' 75 years of pump manufacturing experience is able to meet.

Consultation and information on your pumping problems and projects furnished on request, without obligation.

**MORRIS MACHINE WORKS**
Baldwinsville, N. Y.
*Branch Offices in Principal Cities*

MORRIS

## Tennessee Phosphate

*(Continued from page 109)*

Over the period of approximately a year's operation the rope cost on the large machine ran $650, while that on the smaller machine came to $450 in spite of the fact that 25 percent more dirt was moved with the latter, indicating better design of sheaves and drums for the size of the rope handled. It seems, however, that to save weight and thereby increase the mobility of the small machine the designers sacrificed ruggedness with the resultant repair bills on frame and engine overcoming the advantage gained by the greater dirt tonnage handled. Complete analysis showed that the large machine actually worked a fraction of a cent per ton cheaper.

### Haulage

As mentioned above, transportation is effected by narrow gauge locomotives of which the 18-ton Davenport-Besler operating on 125 lb. gauge steam, is an example. The tram cars are usually 4-cu. yd. side dump Westerns with wooden bodies. Trains are from 10 to 15 cars in length and are hauled over 36-in. track made up of 30- to 40-lb. rail and 6- x 6-in. locally sawn oak ties, laid directly on the field without ballast except on the main line. Straight run grades up to five percent are permissible for empty trains, but a grade of three percent is likely to cause trouble to a loaded train especially in wet weather. Caterpillar Diesel bulldozers are used for grading, saving a large amount of track labor formerly done by hand. One of these machines also handles the rail in preparation for laying and where sectional tracks are used it practically does the laying except for final alignment and spiking down at the section joints.

For loading, the individual tram cars of a train are spotted one by one on the intersection of the radius described by the dragline bucket and the track. Because of their small capacity and high center of gravity the loading must be performed carefully to prevent wrecks on the haul to the washing plant caused by unbalanced loads. Even with the exercise of reasonable care in loading, tram car wrecks are common, causing tie-ups and repair costs out of all proportion to the original misloading. Careful loading consumes more time on a small target than on a larger one, and in his attempt to distribute the load perfectly the dragline operator will often come too close to the tram car with his discharging bucket, thereby causing damage to the bed by impact.

The trams, upon arriving at the plant, must have their dump chains unshackled individually, a task requiring two men. The box-like body discharges clean only on very wet or very dry muck either condition of which is the exception rather than the rule, so digging-out labor is almost always required. Sixty to eighty cars must always be kept in first class shape, representing constant replacement of the heavy 4-in. bed timbers, much blacksmithing on chains and bars and high cost machine work on journal bearing replacements as well as wheel and axle fitting.

Much larger capacity, all steel cars, designed with lower center of gravity and cornerless bed, would not only reduce maintenance cost because of the reduction in rolling stock requirements, but would increase loading rate at the dragline, reduce spillage at the point of loading, eliminate wrecks, and obviate the necessity of digging-out at the washer. The shortcomings of the old system are recognized but scrapping a system which still does a fair job is difficult to justify, especially since there is no example to point to as a means of direct comparison.

It is significant that the latest operations to open up in the region are trying new departures—one in mining, the other in transportation.

### New Developments in Excavation

The Tennessee Valley Authority has developed hydraulic mining at its Columbia plant, similar to that used in Florida. Some attempts had been made before with hydraulick-

*(Continued on page 129)*

**Why cost-minded producers are installing *Simplicity* gyrating screens**

There's nothing mysterious about the outstanding sales success of Simplicity gyrating screens in the aggregate industry. Producers are simply comparing first costs, depreciation costs, maintenance costs, and production speed of Simplicity units. And they soon see that Simplicity's give them by far the greatest value for their money.

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Right: A 5'x 12' Model D double deck Simplicity gyrating screen.

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NEW LEADER Truck Body Type

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This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

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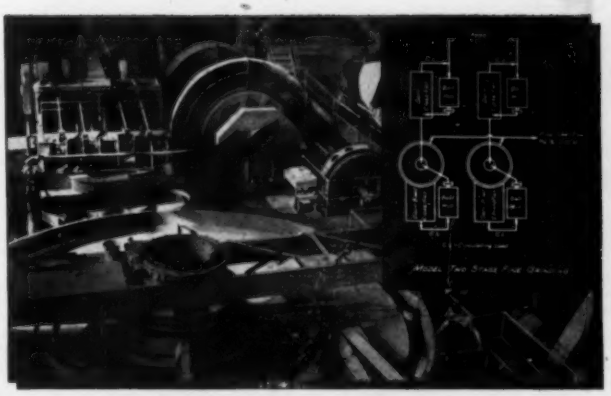

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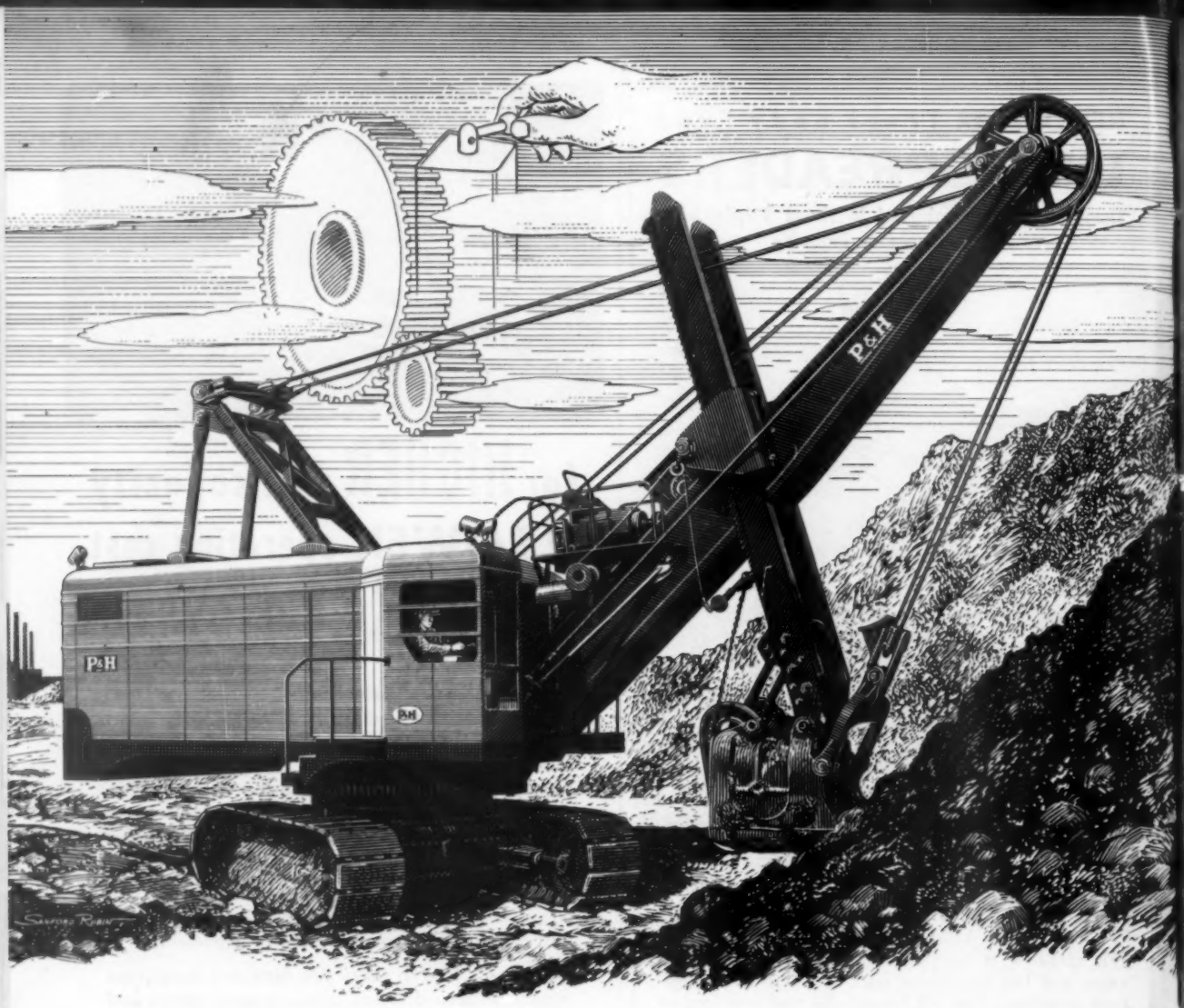


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ROCK PRODUCTS'

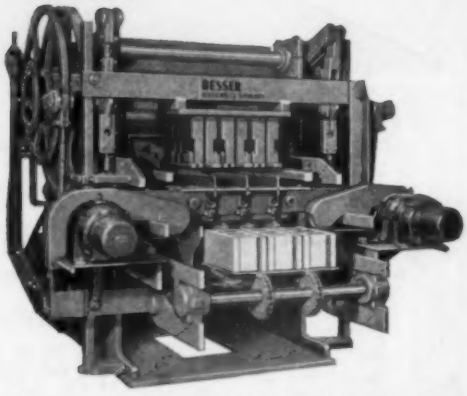
# CONCRETE PRODUCTS AND CEMENT PRODUCTS

• Attractive example of billboard advertising of Hamden Building Tile Co., one of the many progressive promotional ideas of this company.

Entering Hamden HOME OF
HAMDEN BUILDING TILE CO.
See Your ARCHITECT Now For POST-WAR PLANNING
OFFICE & PLANT DIXWELL AVE.
NEW ENGLAND'S LARGEST CONCRETE PRODUCTS PLANT

# Concrete Masonry Units for Individual Architecture

The new handling and treatment of concrete masonry by skilled architects and builders insures individuality and style that make Besser Vibrapac Better Concrete Masonry Units in effect a new building material. Vibrapac units not only provide for beauty and good taste but offer the permanence, safety, comfort, low first cost and low upkeep so desirable in all classes of building structures.




Besser Super Automatic Plain Pallet Vibrator. Capacity 600 8" x 8" x 16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

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*Licensed under the Gelbman basic vibration patents.*

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THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

# Planning for Post-War Business

**Phenomenal growth of Hamden Building Tile Co., Inc., attributed to aggressive sales program, wage incentive plan, and a quality product. Plant improvements contemplate production of 5,000,000 units annually after the war**

By BROR NORDBERG

Attractive sign on main road designating location of plant and office

MANY ARTICLES have been written in these columns on the activities of manufacturers of concrete masonry units, but seldom have we had as a subject a concern as aggressive and energetic as the Hamden Building Tile Co., Inc., Hamden, Conn. Here is an organization that mushroomed from a one-man, backyard enterprise a few years ago into one of the largest manufacturers of concrete masonry units in the United States.

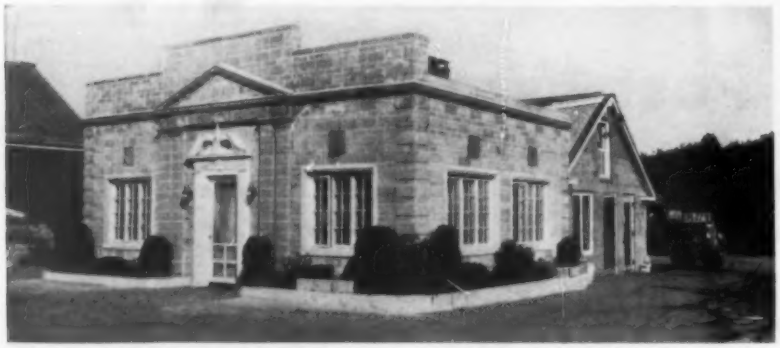
And here is a concern that has faith in the future, for it is basing and actually putting into work definite plans for a post-war volume of business nearly double its all-time record in 1943. During that year, the equivalent of 3,000,000 standard 8-in. cinder concrete units was sold within the limits of the State of Connecticut, with its population of 1,700,000, establishing the company as the operator of New England's largest concrete products plant. Its post-war plant is being designed for 5,000,000 8-in. equivalent units.

## Growth of Business

Growth of this company and its business is a splendid example of how initiative and industry may be rewarded under our system of free enterprise and opportunity. Ciro Paolella, president of Hamden Building Tile Co., was a brick mason by trade. Back in 1922, he became interested in making concrete block and bought a hand machine with 38 pallets, which he installed in a 16- x 30-ft. shed. The shed had no roof and he had to cover his machine each night.

In 1923, he purchased his first power-driven machine and soon had two tamper machines in operation turning out heavy aggregate concrete units. The four-acre tract which the plant occupies today was purchased in 1926 and, in 1928, with outside financial assistance he incorporated Hamden Building Tile Co. When his three sons, Philip, Alfred and Ralph, grew big enough to work, they pitched in to help their father. They worked in the plant after school and had little time for participation in extracurricular activities that occupy so much of the time of school-age boys. The family constituted the entire company personnel through the 1928-1935

Left: Alfred, in charge of production; Ciro Paolella, president, and Philip, in charge of sales. Right: The entire office staff in front of modern concrete office building



This concrete office is an effective sales incentive. Its construction is designed to demonstrate the versatility of concrete masonry

period, when the operations were so elementary that the boys had to bring mixing water to the plant in buckets from a nearby creek.

In 1936, Ciro Paolella took his sons into the business. It was that year that the company started to manufacture lightweight cinder block to enlarge its field of opportunity and, from then on, a rapid expansion in the business took place. Sales volume was 57,000 equivalent 8- x 8- x 16-in. concrete units in 1935, in 1936 it jumped to 102,000 and in 1943 it had increased to 3,000,000. A major plant expansion program was undertaken in 1940, when vibrating-type block machines were installed and modern steam-curing kilns were constructed. Today, the Hamden Building Tile Co. employes 50 men. Officers of the company are Ciro Paolella, president; Philip, treasurer; Alfred, assistant treasurer; Ralph, vice-president, now in the armed forces; and Rose, secretary. President Ciro Paolella still has the masonry trade in his blood and, at the time of our visit to Hamden, we found him in his work clothes laying concrete roofing tile on the undercover curing sheds. In conducting the business, he participates in an advisory capacity to his sons in regular Sunday morning "board of director" meetings.

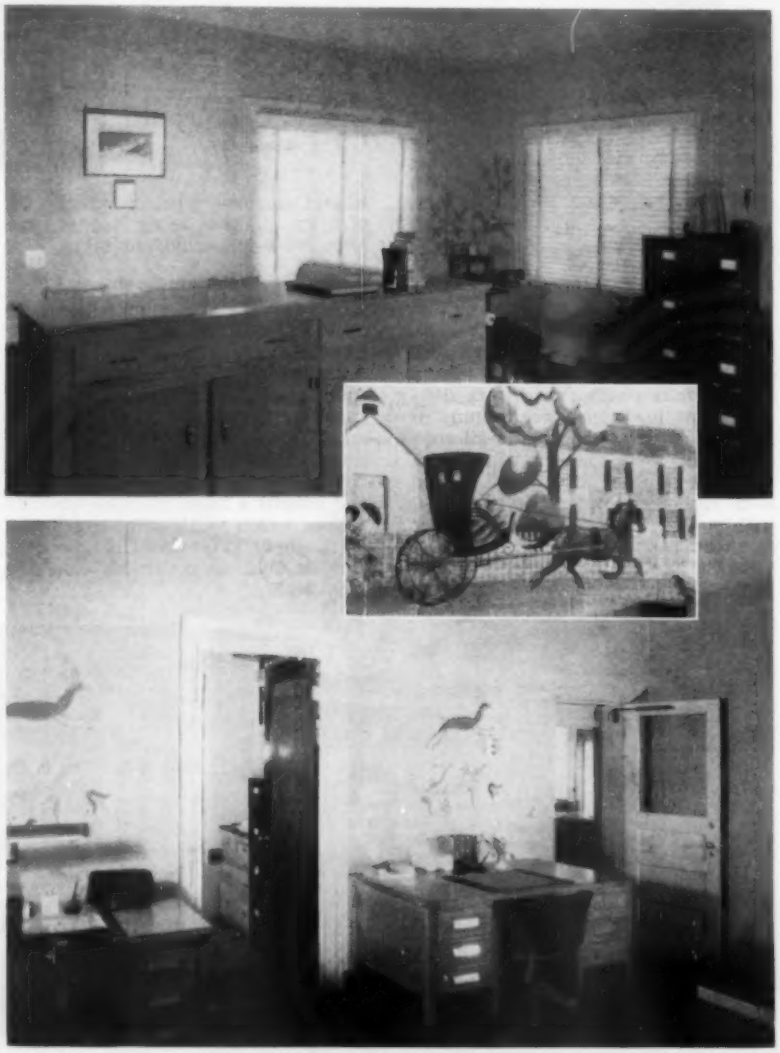
Philip is in charge of sales and we might add that he is a most aggressive merchandiser. His first salesman was hired in 1942 and his post-war organization will comprise a sales manager and three salesmen. He is a strong believer in advertising and sets aside a definite budget for the purpose each year based on gross volume of sales. Some of the sales methods and merchandising tools will be discussed later in this article.

Alfred has the active responsibility for production. His cardinal principle is to make the best concrete unit he knows how, and plant revisions are constantly going forward in that direction. Insofar as production and costs are concerned, he is tackling operations from the point of view that he is in the material handling business. Therefore, he is directing much of his attention toward that phase of operation as the biggest opportunity for reduction in production costs. His post-war plans envision entirely new ideas in yarding and loading.

Recognizing the need for technical training and experience in the manufacture of high quality products, the company has engaged Earl A. Soloman as products engineer in charge of research and development. Mr. Solomon has been sales engineer for Pennsylvania-Dixie Cement Corp. for many years. The plant will be discussed further along in this article.

### Products

Products manufactured include cinder block, sand concrete block, precast lintels and sills, concrete posts, sectional boxes for cemeteries and a small amount of concrete cribbing. The last three items named



Above: Interior of one of the private offices with painted designs on concrete walls. Inset: Close-up of painted designs on concrete wall in Philip Paolella's office. Below: Another private office, demonstrating the use of painted designs on masonry walls

are rapidly growing sidelines. A concrete filler tile floor system will be introduced after the war which, it is believed, has tremendous volume sales possibilities.

Since 1936-1937, when the company started an educational campaign directed toward architects and was successful in getting concrete masonry specified for many projects, a variety of types of construction, both large and small, has been built of concrete masonry throughout Connecticut. Among them are painted exposed ashlar homes in all price classes; colored ashlar school jobs; painted exposed walls for schools and auditoriums, and backup walls; and industrial building. Merchandising activity now is being heavily concentrated on the farm market.

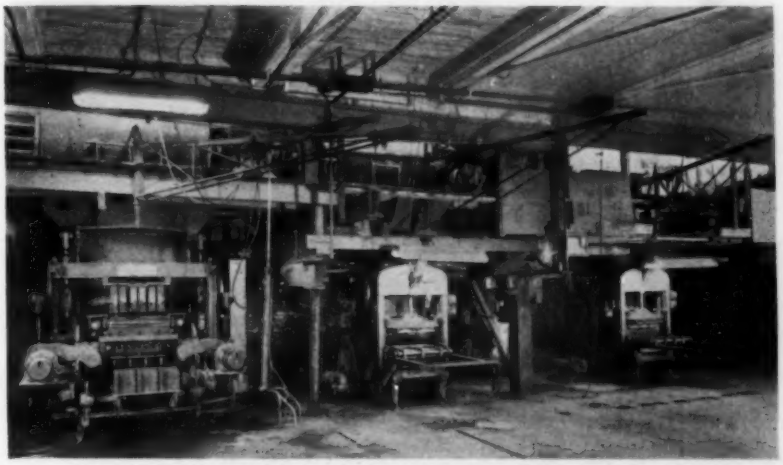
During the war, housing projects and other large volume construction, ranging from 100,000 to 250,000 units each, comprised one-third of the business and the balance was made up of the ordinary 500 to 1000 unit orders. One outstanding order in 1943 was for 28,000 ft. of vibrated, lightweight aggregate concrete lintels. Small jobs have represented 75 percent of the volume in 1944. Industrial construction was a considerable factor during the construction for the war building program and, in 1944, some industrial construction has continued.

### Merchandising

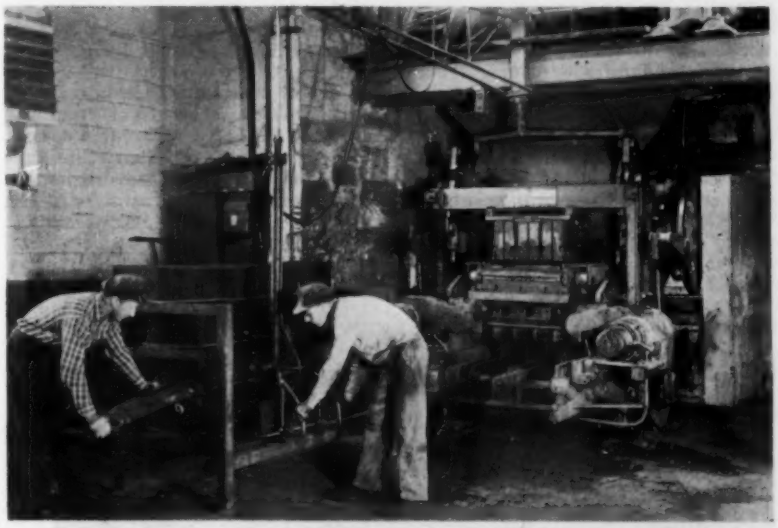
Sales activities are confined to the State of Connecticut which is served by 60 lumber and masons supply dealers handling Hamden units. Prices are varied according to the length of truck haul from the plant in increments of 15 miles, the maximum haul being 70 miles. A big proportion of sales is routed through the dealers and the sales personnel confines its attention to calls on the dealers, real estate companies, architects and builders.

Direct sales activities are supplemented by a continuous direct mail campaign supported by advertising. Brochures with various themes are circulated, with the dealers' names imprinted, and extensive use is made of Portland Cement Association literature. For example, 15,000 copies of the P.C.A. farm folders were recently purchased and the bulk already is in circulation in the farming districts. As a rule, such mailing pieces carry the instruction, "See your local building supply company for information."

Posters are used widely to publicize the company name with patriotic appeals in support of War Bond drives, etc. Distribution is to Granges, dealers, barber shops in the country communities, clubs and in other places where they may be



Three high capacity block machines produce average of 10,000 units per day



Close-up of one machine, showing off-bearer and type of curing rack in service

Batching floor, showing three batch mixers and traveling weigh hopper

A typical small house built of Hamden building units

given prominence. Wallets and novelty gifts, far too numerous to mention, are given to architects and builders in appreciation for their efforts in building with concrete masonry.

From 2 to 3 percent of gross annual sales are earmarked for advertising of many sorts. One of the most interesting forms of advertising, for a concrete products manufacturer, is the use of full-sized 12½- x 50-ft. signboards strategically located on the principal highways leading to Hamden and nearby New Haven. There are nine within a 60-mile radius of the plant. Sign advertising is purchased on contract from the Outdoor Advertising Co. at a cost of $35 per month per sign. The first series is institutional advertising, as illustrated herewith, mainly with an architectural message and to display the company name; the next series will be designed to sell concrete masonry. Considerable newspaper space is also purchased.

### "Demonstration" Office

One of the most effective sales tools, in our opinion, is the company office at the plant which was designed by an outstanding architect for the purpose of being a practical demonstration of how effectively concrete masonry can be used in a variety of patterns. Appearance is of extreme importance in this market area.

The office has several private offices, each of which is different. The walls are of random ashlar or coursed ashlar pattern, colored in various shades and some with beautifully painted designs. The effectiveness of these designs has satisfied the company that concrete masonry can be adapted to game rooms and other interiors where beautiful treatment is essential. The window frames, sills and the ceilings and floors are all of concrete. In one room the floor is covered by carpeting, in another with asphaltic tile and, in a third, with wood flooring. The ceiling in one is painted for a smooth finish, another has acoustical tile and a third has a sand-finished plaster coat.

An identifying name, "Plasticrete," for Hamden building units is to be copyrighted and the company name will likely be changed to conform, and that name is to be the basis for post-war merchandising to establish

Left: Overall view of plant. Covered storage for 150,000 units is provided on left. Specials, including concrete sectional boxes, are manufactured in right end of building

Below: Close-up of main plant with curing kilns in foreground

concrete masonry as a versatile plastic structural material.

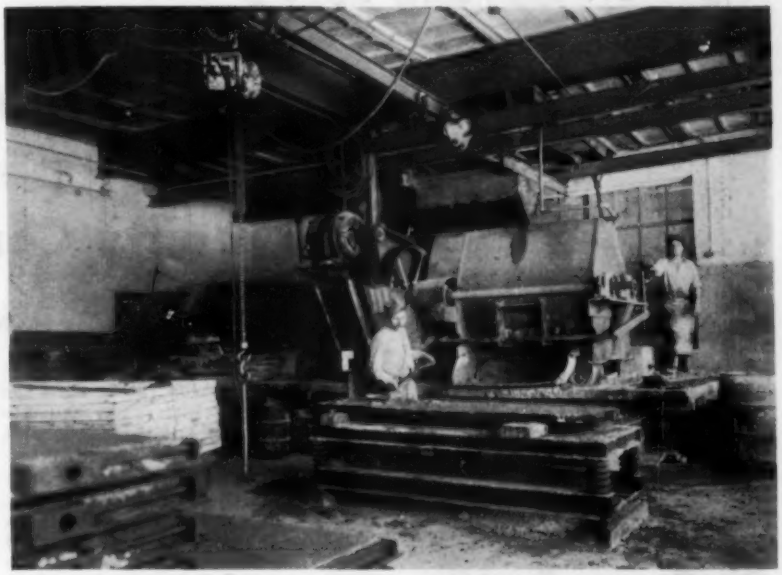
### Plant

The plant has undergone many important improvements during the past few years and will undergo further reconstruction for post-war operation. Several phases of the present plant operation are of particular interest. First, there is a wage incentive plan, now in effect for six years, that has enabled the company to hold its employes during a period of labor-pirating for war-inflated wages. Secondly, the company has installed a bulk cement plant and proportionating equipment the equal, for accuracy, of any systems used by the ready-mixed concrete industry. Another feature is that there is undercover storage for 150,000 units and a complete machine shop equipped for the repair of any breakdowns. The shop has a planer, drills, lathe, electric and acetylene welders and the foremen (3) are all capable of operating these machines.

The cinder crushing and grading plant is slated for rebuilding after the war, principally to provide greater storage and a cinder dried before it is crushed, to increase crushing and screening efficiency, and for better mix control.

At present, high grade, hard cinders are procured from two power plants. At the plant, trucks (company-owned or contracted) dump either into hillside reserve storage bins for rehandling by truck or dump into a hopper at the crushing plant. The cinders are well aged and come from old stockpiles at the sources of supply.

The cinder crushing and screening plant has two sets of roll crushers, a single-deck vibrating screen, an 18-ft. long revolving screen, and a bin capacity of 250 cu. yd. (two bins), the bins being located above the batching floor. A short belt conveyor with a magnetic tail pulley feeds the cinders from the truck hopper to the primary rolls and a bucket elevator carries the crusher product to the overhead vibrating screen where the bulk of minus ¼-in. fines are screened out into one bin. The balance of the fines are screened through the revolving screen and a ¼- to ⅜-in. product is also screened out into the coarse aggregate bin. Plus ⅜-in. oversize is recrushed through New Holland smooth-faced rolls and then rescreened. Plant consumption is 200 cu. yd. of cinders per day.



Casting precast slabs on vibrating machine for concrete sectional boxes

### Bulk Cement

A 1944 development was the installation of a bulk cement plant. In 1943, 30,000 bbl. of high early strength portland cement was consumed, which was handled in sacks by hand labor. A 300-bbl. car of bulk cement can now be unloaded in two hours. Cement is stored in a 1200-bbl. bin which is divided into three compartments—one for cement and the other two for Waylite, Celocrete or other special aggregates, which are handled from cars with the bulk cement screw conveyor and elevator.

The two cinder bins and the cement bin are in a row paralleling three batch mixers serving three block machines on the floor below.

*(Continued on page 126)*

Machine shop on left, main plant on right. Balcony, to the right, for use of employes at lunch time

Company donated masonry units for construction of a number of American Legion airplane watch towers

Fig. 1: Conical section of precast manhole shown in Fig 5

Fig. 2: Close-up of end of conical section

Fig. 3: Adjustment rings for reinforced concrete manhole

Fig. 4: Form assembly and steel reinforcement for conical section. These views were taken at the plant of Valley Concrete Products Co., Yuba City, Calif.

# TOMORROW'S BUSINESS Depends on Quality Concrete Today

By M. W. LOVING*

IT IS THE EXCEPTION rather than the rule to find high class concrete products of any kind produced in a run down, poorly managed plant. When an engineer, architect or other user visits a concrete products plant, he will judge the quality of the products by the general appearance of the plant, inside and out. On a recent visit to California a very successful manufacturer of concrete products told me that when he first engaged in business in that locality several years ago, the users were very much prejudiced against concrete products for this reason: a number of manufacturers had practically ruined his territory by making and selling concrete products of fair to poor quality.

This manufacturer said his success was due to his determination, at the outset, to manufacture and sell concrete products of standard quality at a fair and reasonable price. He could not and did not try to meet the prices of the others because they could not make products of standard quality more economically than he could. Thus, if they sold for less they could not stay in business—provided the engineers, architects and other users specified and used concrete products of standard quality. He invited the engineers and architects to visit his plants and showed them how concrete products were made and tested them in their presence. The end result of this was that, after two years, all but one of his former competitors were out of business and working in one of his plants. This man is not a large operator nor did he succeed at the expense of his competitors. He got ahead because he manufactured and sold concrete products of excellent qualities at a fair and reasonable price. In doing so he reestablished the good name of the concrete products industry in his territory.

## Size of Plant No Criteria of Quality

In more than 28 years of practical experience in this field I have been privileged to examine concrete products plants, from the smallest to the largest, in all sections of the United States and Canada. The best concrete products are often produced in some of the small and medium sized plants. There are very large operators who still use antiquated equipment and methods of production; while the products they produce are acceptable according to the specifications under which they are manufactured, they do not always compare in quality with those produced by some of the medium sized or even small plants. Generally speaking, however, the larger and more substantial companies produce concrete products of excellent quality.

One very large operator attributes his success to the devotion to duty of his associates and especially the superintendents and the workmen in his plants. He has a production engineer who spends all his time helping superintendents of the plants manufacture concrete products to meet and exceed specifications requirements at low production costs. He constantly tells his men that it is very expensive, in the long run, to produce inferior products if you expect to stay in business and the most economically operated plants are those where good products are produced day in and day out.

When I first engaged in this business, in 1916, as an engineer for one of the largest producers of portland cement, my function was to aid the users of cement in manufacturing and selling concrete products. Most of the plants in those days were small, from the standpoint of invested capital. Today, some of the former small operators are engaged in business on a very large scale and have prospered simply because they gave the customers what they paid for—concrete products of excellent quality.

Conversely, there are many more who have faded from the picture and are long forgotten with this one exception: the products some of them made failed in service and, in many cases, created a black eye for the industry. There is nothing better

*Consulting engineer.

than good or nothing worse than poor quality concrete or concrete products.

## Machinery Sold to Incompetent Drain Tile Producers

In 1916, mailing lists indicated that more than 100 concrete drain tile manufacturers were engaged in business in each of several middle western states. Today there are very few of these plants in operation and few realize that so many ever existed. In reality, the mailing lists indicated where concrete drain tile machinery had been sold. One enterprising salesman of drain tile machinery followed this procedure. He would go to a small town in a prosperous agricultural community and call on a local building material dealer or some other prospect and tell him how much money could be made in the concrete drain tile business.

If the prospect was skeptical, as he usually was, this salesman would hire a horse and buggy from a local stable, drive into the country and visit the farmers within a radius of several miles of the town. He would tell the farmers how important it was to drain marshes and other nonproductive land on their farms and at the same time he would persuade them to fill out a form indicating the approximate amount of drain tile required by each farmer.

Armed with this prospective business, he would then go back to the material dealer or other prospect and show him the potential business in that locality. He would say: "All you have to buy is cement (he pronounced it 'seement'), and you can get your sand out of the creek:" He usually sold a drain tile machine; in many cases they were never installed by the gullible prospect, and in those

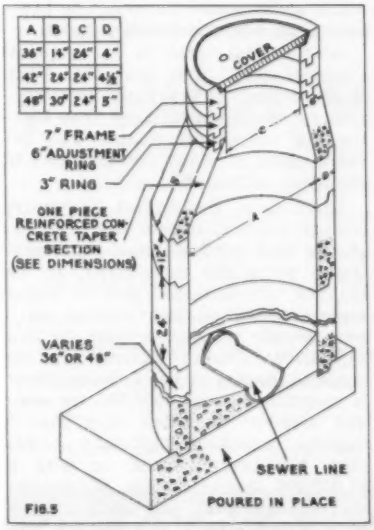



**Fig. 5: Perspective drawing of reinforced concrete manhole manufactured by the California Concrete Products Co., Inc., San Jose, Calif.**

**Fig. 6, to the left: One manufacturer uses surplus concrete at the end of the day's run to cast flagstones. Fig. 7: The finished product after removal from the forms**

cases where an attempt was made to produce cement drain tile, the product usually was of a very inferior quality.

Failures of this kind of drain tile in service were attributed, by the competitors of concrete drain tile, to acids and alkalies in the soils. In 1921, I examined concrete drain tile systems in service on 53 farms in 9 counties of Wisconsin. Samples of drainage water and the soil were sent to a laboratory for analyses. Without exception, there was nothing in the drainage waters or soils that would disintegrate concrete drain tile of standard quality. The failures were due to the use of a concrete mixture in which an insufficent amount of water—the cheapest ingredient of concrete—was used to properly hydrate the cement. The very dry mixture used, to expedite stripping of jackets, was entirely responsible for the numerous failures. Only one manufacturer of concrete drain tile is in business today, to my knowledge, in Wisconsin; that firm is the Waukesha Cement Tile Company, Waukesha, Wis. This company, from the period of 1916 to the present day has made concrete drain tile of excellent quality.

## Standard Specifications a Measure of Quality

An aggressive salesman can sell anything. If that "anything" will fill the requirements under which it is sold, the salesman will be welcome when he returns for another order. Concrete products are manufactured and sold under the test and other provisions of the Standard Specifications of the American Society for Testing Materials. These specifications have been prepared by committees consisting of practicing engineers and architects and a smaller number of experienced manufacturers. All specifications are based on research and practical experience. More than anything else, these A.S.T.M. standards are responsible for the progress of the concrete products industry because they afforded a yardstick—a guide for the manufacturer and a positive assurance for the engineer or architect that the products were made in accordance with the best practice.

Before they were prepared and generally used in this country, many of the manufacturers had no way of knowing good from poor quality concrete. Many of the failures of the early days can be attributed to the lack of standard specifications. A very prominent manufacturer of electric ranges recently died and, among other things, it was said, "He once lost his shirt in the concrete products business in Minneapolis." Chances are nine to one that he failed because he innocently made concrete products of inferior quality, for the lack of a specification in that period—about thirty years ago.

The successful manufacturer sees to it that his plant superintendent manufactures concrete products of standard quality to meet and exceed the test and other provisions of A.S.T.M. specification. The inspector or the user is on hand to see that they get what they pay for. No manufacturer can succeed, in the long run, in just getting by the tests. He may by-pass the inspector but, sooner or later, the chicken will come home to roost. Failure in service may cause damage and expense out of proportion to the initial cost of a single unit. It is unfortunately true that competitive products may fail and cause great damage to streets and other utilities but one seldom hears about what caused the trouble. When and if concrete products fail under similar conditions, the reasons must be forthcoming and the product is usually mentioned in the newspapers and technical magazines. On many occasions I have discussed the advantages of concrete products with practicing engineers and architects who were very much prejudiced against, and said they would not specify, concrete products under any circumstances. Asked why, they did

*(Continued on page 128)*

# Venezuela Turns to Concrete Products

## Large public health construction program has created big market for concrete pipe and block

By GEO. W. HOFFMANN

Exposed concrete sewer pipe lines rest on walls of concrete block

PRESENT enormous construction developments in Central and South America point to a new era of industrial and agricultural progress now under way. While the Spaniards transplanted European construction methods and styles into the new world, there is today being exemplified an original creative spirit and new ideas which demand respect and admiration.

An outstanding example of these advances in Latin America may be found in the United States of Venezuela. Residential construction as well as water supply and sewage installations recently completed have actually transformed the face of that country within the past few years.

On January 31, 1942, the President of Venezuela, General Isaias Medina presented to the country his "Four-year plan for National Public Health Construction." His program was placed under the direction of a newly created "Instituto Nacional de Obras Sanitarias" which was granted appropriations of $136,000,000 for expenditure between 1942 and 1946. Of this amount, 41 percent or $56,000,000 will be spent for the construction of water works, sewage and drainage systems, and an almost equal amount is to be used for construction of healthful, low-cost housing.

Although Venezuela has ample clay deposits and a number of clay products plants, many of the government-controlled, low-cost housing projects have been built with hollow concrete masonry units made with sand and gravel aggregates. Due to the healthful insulation qualities of this building material most of the better class private homes have been built of concrete masonry.

So great has been the demand for concrete products that the production of two existing cement plants in Venezuela has been entirely insufficient. Two new plants are now under construction while two additional plants are scheduled to be built.

For sewage disposal installations, approximately $23,000,000 already has been spent. Three existing concrete pipe plants using McCracken equipment have been supplemented with four new installations. Concrete sewer pipe is now being locally manufactured in almost every large city while some plants for concrete pressure pipe are under construction.

An unusual sight is the exposed concrete pipe lines and the catch basin towers. This exposed construction for the main disposal lines leaving the cities and villages was decided upon in many communities to facilitate servicing.

In Caracas, the capital, the entire sewage disposal system has been replaced with concrete pipe, representing a $4,500,000 investment. In La Guayra, the principal port of Venezuela, excavation has started on a new sewage disposal system to cost $1,000,000. Ciudad Bolivar in the tropical jungles of the Orinoco River is spending almost $500,000 for sewage disposal facilities, and Puerto Cabello, another important coffee port, has been cleaned up with a $1,000,000 sewage system. Maracaibo, the oil metropolis, has been in need of a water supply and sewage disposal improvements for many years.

(Continued on page 126)

Typical low-cost bungalow of concrete masonry to be found in a number of housing projects throughout Venezuela

# Ask Yourself

**Question:** How can I speed up curing to conform with present high speed production rates on block and brick machines?

**Question:** How can I reduce stock pile investments, speed up deliveries, and service larger jobs within a shorter time?

**Question:** How can I insure delivery of dry, fully cured, shrink-proof concrete?

**Question:** How can I obtain high early strengths with less cement, obtain block free from spalling, crazing, checking, leaching and efflorescence; free from volume changes, expansion or contraction when laid dry in wall?

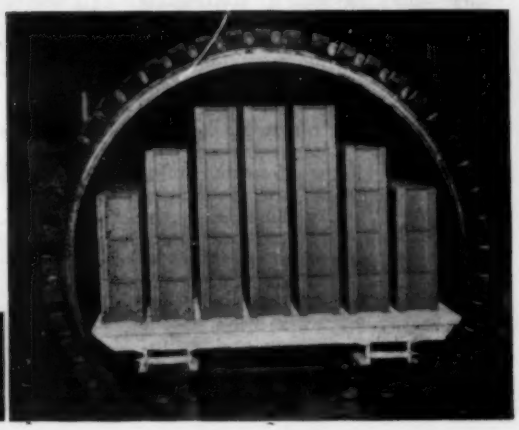
## THE ANSWER TO ALL

These questions which perplex Concrete Products Manufacturers are . . . J & C HIGH PRESSURE STEAM KILNS.

JACKSON & CHURCH CO. J&C SAGINAW MICHIGAN

# HIGH PRESSURE STEAM KILNS

High pressure curing is an important technical aid to better concrete because it makes a finished product that consistently has the high qualities demanded by the most exacting architects and construction engineers. J & C have been the leaders in high pressure curing for many years. Products cured in J & C kilns meet all the questions asked above—and more. You should get the complete facts, given in our brochure on High Pressure Curing. Write today for your free copy.



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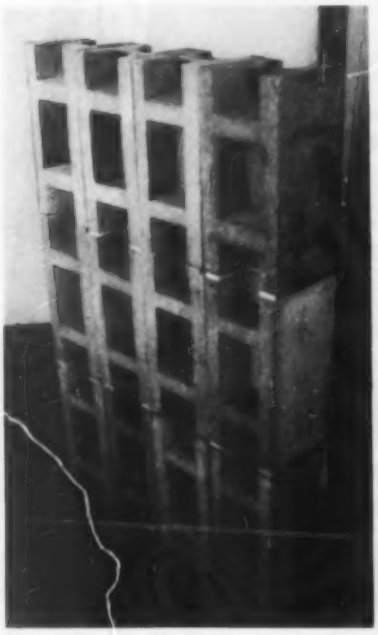
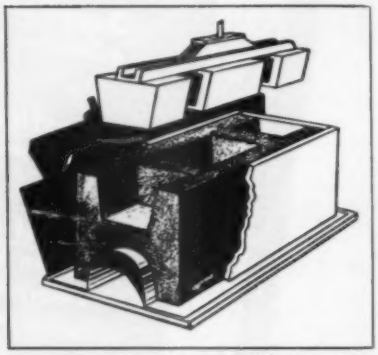


Left: Artery blocks laid up in wall panel with the square-recess side. Right: Opposite channel recess side of block laid up in wall panel to show how it may be used for neon lighting and various architectural effects

**New design masonry unit offers unusual architectural effects and construction advantages by carrying utilities in ducts formed by the units in the wall**



Artery block are made on simple, light pallet liners, moulding in any special detail

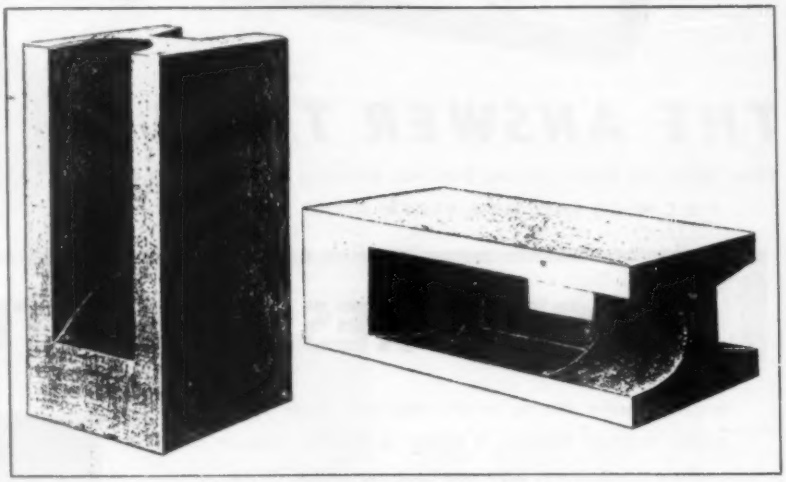
# Modernistic Designs with Artery Block

NEW DEVELOPMENTS in construction in the post-war era are expected to stimulate demand for masonry units which may be adapted to new concepts in heating, cooling, plumbing, lighting and modernistic architectural effects. The Artery concrete block, on which patents have been applied for, is a unit which has been designed by Arthur L. Kuhlman of Kuhlman Electric & Manufacturing Co., Bay City, Mich., to meet this demand.

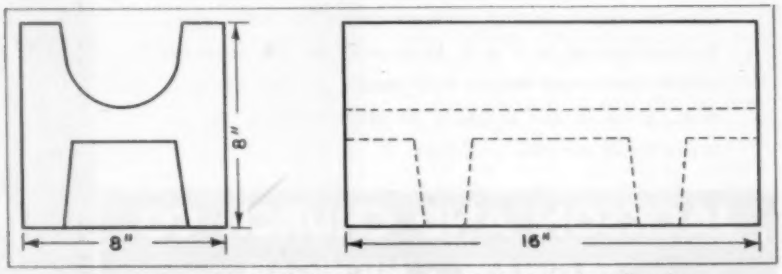
As shown in the various illustrations, this unit has two opposite plain faces; one with a large, long groove, forming a duct or recess when laid up in the wall; and the other side having a contrasting straight line, cross member arrangement, aligned for effectively tapping the duct space while providing space for concealed reinforcement channels for brackets, and sign steel anchorage where required.

The recessed side of the units in the wall provide for interesting architectural designs and the installation of neon tube lighting. For the architect, some unusual opportunities are opened up for variation in design by using either side of the unit to provide different panels, the incorporation of glass brick in the construction for lighting, and the introduction of French window effects. By simply turning the block from

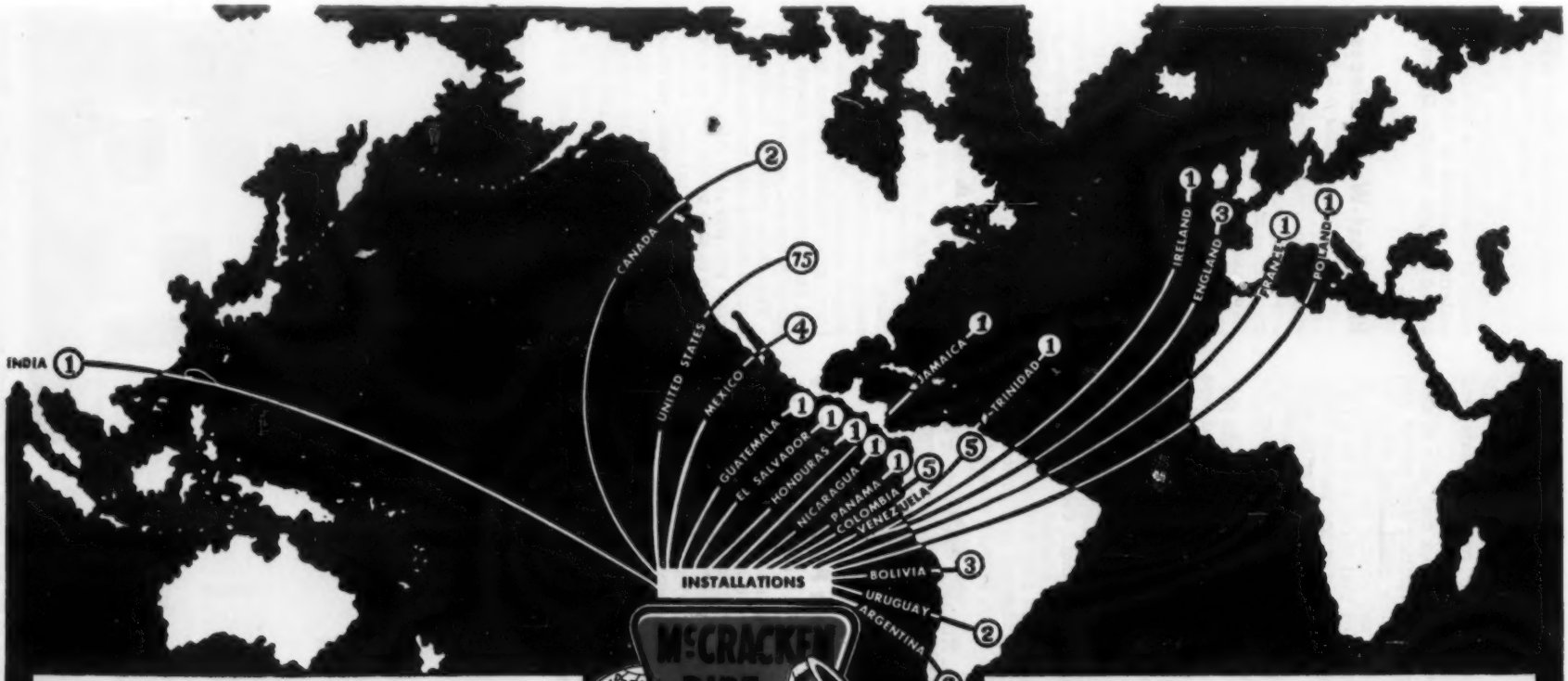
(Continued on page 126)



Showing recess construction of new block design




Cross-section and longitudinal section of artery block of standard dimensions




McCRACKEN Model "T" makes pipe 4" to 36", incl.

McCRACKEN Model "R" makes pipe 4" to 18", incl.

Production Capacities of Both Machines:

4" to 12"—2 pipes 3' long per 1 minute.
15" to 18"—1½ pipes 4' long per 1 minute.
21" to 36"—2 pipes 4' long per 3 minutes.

Actual average production cost six cents per foot of 6" corrugated concrete pipe.

Write us for literature on how to make good concrete pipe at lowest cost.

McCRACKEN Modelo "T" fabrica caños desde 10 cm. hasta 91½ cm.

McCRACKEN Modelo "R" fabrica caños desde 10 cm. hasta 46 cm.

Capacidades de producción de ambas máquinas:

10 cm. hasta 30 cm.—2 caños 1 m. de largo cada minuto.
38 cm. hasta 46 cm.—1½ caños 1,20 m. de largo cada minuto.
53 cm. hasta 91½ cm.—2 caños 1,20 m. de largo cada 3 minutos.

El costo promedio de fabricación de un caño corrugado de 15 cm. es seis centavos de dólar, por pie.

Pida catálogos sobre cómo hacer buena cañería de hormigón a bajo costo.

# CONCRETE PIPE MACHINERY COMPANY

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EXPORT OFFICE:
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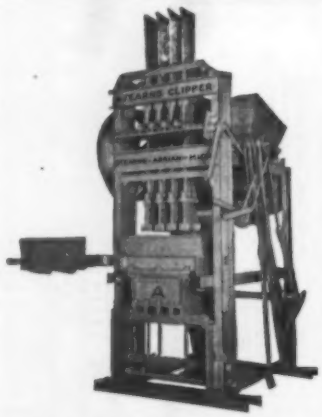


"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Sterns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.

G. M. Friel, Mgr. Columbus 8, O.


## Artery Block

*(Continued from page 124)*

one side to another, a plain wall, panel wall, or recessed-square wall effect may be secured.

The artery block may also be used to conceal plumbing and wiring, and the channels could form ducts for heating and cooling the building. It is expected that there will be an insistent demand in the coming building era for concealment of all utilities, and the new unit is designed to fit into these new construction designs.

This new unit is said to make possible high capacity and integral type chimneys, ventilators, furnace ducts, and fireplace heating ducts. It also provides a recess for awnings.

A wide range of related but individual architectural and color effects are possible with this masonry unit, and Mr. Kuhlman, the inventor of the block, is confident that it will facilitate the introduction and use of more mechanical equipment in the home, store, farm, and office buildings.

Mr. Kuhlman, the inventor of the block, plans to license concrete products manufacturers who desire to make the new block at a very nominal fee per unit.

## Venezuela Favors Concrete

*(Continued from page 122)*

Its location and topographic conditions have complicated such construction, but today a new $2,500,000 sewage disposal system is considered one of the finest in all Venezuela.

While Venezuela's efforts to bring healthful living conditions to rich and poor are to be highly commended, the important part that officers of the Health and Sanitation Division of the Coordinator of Inter-American Affairs has played in bringing about these improvements cannot be overlooked. These improvements in living conditions have done much to stimulate the production of materials essential to victory for the armed services of the United Nations.

## Plan Post-War Business

*(Continued from page 119)*

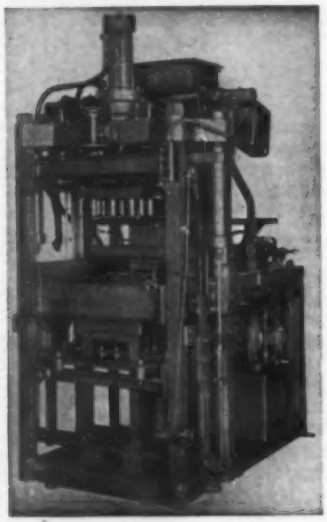
with an electrically-propelled travelling weigh hopper for weighing the proportions of aggregates and cement. Two grades of cinders are weighed by a Toledo scale calibrated to 25-lb. accuracy, and a separate weigh beam with a Toledo scale, accurate to 1-lb. graduations, proportions the cement into the hopper. A 4-bag mix is the largest required. The cement valve is activated by levers for a sharp cut-off of flow into the hopper. Extreme accuracy, much more so than in a ready-mixed concrete plant, is needed in this operation since relatively small quantities of cement are handled per batch.

Two 42-cu. ft. mixers serve two Stearns No. 9 Joltcrete block machines and a 60-cu. ft. mixer supplies a Besser Vibrapac block machine. After the war, there will be major machinery changes including larger capacity mixers which will have push-button releases to control the discharge and clocks to accurately control mixing time.

The three existing machines are manufacturing an average of 10,000 units per day and kiln capacity is geared to this production on a 24-hr. schedule. There are eight kilns, each of which holds 18 racks carrying 72 standard units each. Racks are handled into the kilns at the rate of one kiln per hour by two hand-operated lift trucks and are removed the following morning at the same rate and


HYDRAULIC VIBRA-PRESS

The Modern Way to Make Block



The only block maker that combines pressing and vibration through hydraulic operation. Vibration is entirely within the mold box and is insulated from the rest of the mechanism. The precision block machine for quantity and quality operation.

The KENT MACHINE CO.

CUYAHOGA FALLS, OHIO

Example of the most modern type of concrete masonry residential construction at Maracaibo

stacked under cover. One power truck and two men will stack 10,000 units on an 8-hr. shift. An Erickson fork lift truck handles sectional box slabs and miscellaneous products into storage.

### Accelerated Curing

A combination of high early strength portland cement and curing by live steam at temperatures as high as 210 deg. F. enables the development of compressive strengths exceeding 700 p.s.i. within 24 hr. and, therefore, early job delivery. The steaming period at these high temperatures is sustained two to three hours. A 150-hp. boiler has more than adequate capacity for curing block and the various specials which are usually steam-cured at the point of manufacture. Loading of trucks can proceed under cover during bad weather and at night. There are lights provided in each bay of the storage shed.

Lintels, sectional box slabs, coping, sills, cribbing, concrete posts and chimney caps are manufactured on a vibrating table from concrete mixed in a 30-cu. ft. paddle type mixer. A roofing tile machine has been installed, to manufacture tile for installation on the roof of the storage area.

Deliveries are made in company-owned trucks, ranging in size from a 15-ton Diamond T dual drive, 6-wheel truck carrying 1100 units and 10-ton payload trailer trucks down to 4-ton trucks. They are White, Diamond T, International, Ford and Dodge makes. Hauling will be done by trailers post-war.

### Wage Incentive Plan

All private industry has suffered to some extent from shortages of manpower during the war, but the Hamden Building Tile Co. has managed to hold its employes despite the competition for labor by war industries. Since 1938, a wage incentive plan of payment has been in effect and wages paid are comparable to those paid in industrial plants.

The only unionized workers are the truck drivers; the plant workers have rejected unionization. They earn a minimum of $1.00 an hour and the lowest job classification cannot pay less than 70c per hour under any circumstances. Machine men are paid a flat rate per 100 units of production and yardmen have a guaranteed minimum wage with plusses for work accomplished over a minimum. Time-and-one-half is paid for all work over 40 hr. a week. Foremen are paid a production bonus over their set salaries based on each 1000 units produced over a set volume. Office men — including salesmen, a personnel man and a traffic man — are paid a bonus for each 1000 units sold over 25,000 per week. Similarly, yard foremen are paid a bonus on the basis of sales, while the maintenance foreman and shop foreman receive bonuses based on production.

All regular workers, with a minimum of six months employment, are entitled to a vacation with pay. Those employed for six months to a year receive three days' vacation, those who have worked from one to five years get a one week vacation, and all with five years' employment or more receive two weeks vacation.

Employes are entitled to certain other benefits. The company purchases gloves for them and will resume the purchase of special work clothes after the war. If a man desires safety shoes, one-half of the purchase price is paid by the company. Recesses are also provided. Hot coffee is served in the plant every morning and cold drinks in the afternoon at company expense. About 4 percent of the payroll is thus invested.

The only employes "lost" during the war are those who have entered the services and according to Treasurer Philip, who keeps in touch with all of them with monthly news letters, all of them have expressed their desire to return after the war. These men are kept informed of all the news concerning their former fellow workers, plant improvements, etc.,


GET ALL THREE
Beauty in Block
Low Production Cost
Simple Operation
in
MULTIPLEX
SUPER
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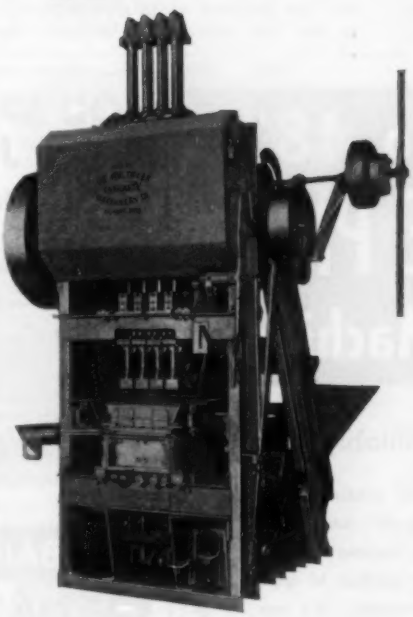

Perfectly finished brick, tile or block on a low cost, low maintenance basis are turned out by the famous Multiplex Super Tamper. This is the combination that will make your business pay.

The Super Tamper has positioned-timed feeding and stripping, and quick-action, 5-point clutches. Handles all kinds of aggregates and produces 4 to 6 top quality units per minute. The Multiplex Super Tamper is engineered and built for a life-time of trouble-free service.

The MULTIPLEX LINE
Includes Power Tampers, Power Presses, Hand Machines, Super Tampers, Mixers, Block Cars and Racks. Complete plant installations — parts — repairs. Write today for the Multiplex catalog.

MULTIPLEX CONCRETE MACHINERY
ELMORE, OHIO

and are remembered every Christmas with gifts. It is recognized by the management that some of the service men are receiving excellent training, which will be taken into account when they return from the war.

Re-employment will be provided by expansion into a 5 million unit per year plant, as previously mentioned, and by the addition of new concrete products, including some specialties, which will be manufactured. The post-war concrete block plant is to be operated on two 9-hr. shifts, allowing one hour a day for machine maintenance, which will provide each worker five hours' overtime at the higher wage rate. Some of the planning is in the drafting board stage, but certain phases of plant modernization and extension are already in work.

## Tomorrow's Business

*(Continued from page 121)*

not know, but they "had heard of the trouble that had been experienced with them in some nearby or distant locality." But once these men were convinced of the merits of concrete products they proved to be regular and very satisfied customers of the industry and they will stimulate the market by telling others of their success with it.

It is not sufficient to merely produce good concrete products, but the successful manufacturer should see that the units he makes are properly used and installed. Many structural and other failures in service are not due to neglect on the part of the manufacturer. Rather they are caused by poor design, construction or both. Strictly speaking, the manufacturers' legal responsibility ends when his products meet and exceed the test and other provisions of the specifications under which it was sold. But it is very difficult to prove, in court or elsewhere, whether or not the products met the specifications at the time the structure was built.

### Proper Installation Important

Besides the manufacturer, in order to remain in business, cannot be too independent in such cases and it may pay him in the long run to make good—assume the cost of replacement rather than run the risk of endangering his reputation. Obviously, there are definite limits to which he can go in this direction. Most of this kind of trouble can be avoided if the manufacturer furnishes his customers with detailed instructions as to how and under what conditions, structural or otherwise, his products should be used. When you once could buy a new automobile, the manufacturer furnished an operating manual—prepared and illustrated in simple detail so the average person could understand it. If the owner failed to have his car serviced at proper intervals, it did not last long. Because the manufacturer had given the customer full and explicit instructions on its maintenance, at the time of sale, he was not responsible legally or otherwise if the owner ruined his car in a short period of time.

It is usually the function of the trade association to prepare and furnish material of this kind on design and construction. But the individual manufacturer is the one to take the lead. Because he, or his representative, are familiar with all aspects of each improvement he should see that concrete products are properly used. It should be remembered, too, that the engineer and the architect make their living by designing and supervising the construction of all structures where concrete products are used. A manufacturing enterprise, large or small, should not furnish detailed plans and specifications that would by-pass the engineer and the architect. Rather the instructions should be prepared for and in the language of these specialists to help them prepare their plans and specifications for any kind of improvement.

## Post War Plans

FISCHER LIME AND CEMENT CO., Memphis, Tenn., plans to rebuild its entire concrete block plant, and it will install a bulk cement handling system in the ready mixed concrete plant. A belt conveyor system will be used to convey aggregates to bins.


Make 6" to 48"
CONCRETE PIPE
with ONE Machine

Produce Pipe Profitably

*Universal's "All-Purpose" Machine* produces Concrete Pipe in all sizes from 6" to 48"—and shows you a worth-while profit. With a tamping capacity of 680 strokes per minute, your product is more dense, durable, finished in appearance. We can also outfit you for making larger sizes, up to 135".

*Write today for Catalog and Details.*

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YOU SPECIFY-WE FURNISH
*Better* Johnston Steel Racks and Pallets . . . are built on order to suit your needs. They are the most economical and efficient that can be made for your plant requirements. Johnston racks and pallets are already giving complete satisfaction in numerous plants. Let us handle your requirements.

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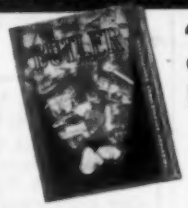
P. T. BARNUM *would have said:*



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OF READY MIXED PLANTS — CENTRAL MIXING PLANTS — BATCHING PLANTS — BULK CEMENT PLANTS — SAND AND GRAVEL PLANTS — CONCRETE PRODUCTS PLANTS — STORAGE BINS — COAL BINS — THE BUTLER CARSCOOP — PORTABLE CONCRETE HOPPERS — CEMENT TRANSPORTS — WEIGHING BATCHERS — CEMENT ELEVATORS — BIN GATES!!!"

BUTLER BIN CO., Waukesha, Wis.

## Tennessee Phosphate

(Continued from page 110)

ing, but without success, the reasons for failure apparently being (1) lack of a sufficient year-round water supply, and (2) the clayey nature of the muck. The general condition in the area is that of too much water in winter, and too little in summer, even for washing, let alone hydraulic mining. The exception is found at the T.V.A. plant which is located on the Duck river, the only stream in the area large enough to deliver a dependable supply of water the year round. The high clay content of the muck tends to cutting up into blocks and ridges instead of slushing into the sump, and which after getting into the pipe line, have an excellent chance to plug it up. The Authority evidently ironed out the difficulties with clay, as their operation attests.

Monsanto Chemical Co. moves all of its muck from mine to washing plant with special 12-cu. yd., bottom dump, Euclid Trac-Trucks. The huge 18- x 24-in. tires have sufficient traction to overcome most wet weather conditions and obviate the necessity for anything but the mere semblance of roads. These trucks have been in operation since 1937 and appear to do the job economically; the haulage distance is short, however, and it remains to be seen whether or not the economy will operate on long hauls. Nevertheless this method dispenses with miles of track and many units of rolling stock. It cuts out hand labor at the dumping site, for the truck merely releases its load, hardly stopping, and a bulldozer then pushes the load within reach of the scraper-hauler feeding the washer.

Recent years have seen the expansion of muck transportation by ordinary gasoline dump trucks. Improvements in secondary roads as well as the remoteness and isolation of new phosphate workings from the established plants, have been the two main reasons for this. Commenting on the latter, the tracts mined today are no longer part of a continuous property owned by the plant in question, but are more often than not, completely isolated from properties connected to the washing plant, and quite small. Rail transportation would involve obtaining of right-of-ways, and much survey work to determine the best route and to figure cut and fill, for on a long haul the terrain is usually such as to demand this kind of work. Thus, on a haul of over six miles the diggings have to be quite extensive to justify railroad transportation. It is under these conditions that trucks have shown to advantage. Within the last year one operator has almost entirely supplanted trams with trucks, and another has deemed it necessary to feed tram lines with trucks from steep hillside deposits.

## Sand-Lime Brick Production and Shipments

Four active sand-lime block and brick plants reported for October and four for September, statistics for which were published in November, 1944.

AVERAGE PRICE FOR OCTOBER

| | Plant Price | Delivered Price |
|---|---|---|
| Detroit, Mich. | ..... | ..... |
| Saginaw, Mich. | $15.00 | ..... |
| Grand Rapids, Mich. | ..... | $16.20 |
| Seattle, Wash. | 19.50 | 21.50 |

STATISTICS FOR SEPTEMBER AND OCTOBER

| | *September | **October |
|---|---|---|
| Production | 1,221,655 | 1,371,845 |
| Shipments (rail) | 385,000 | 400,000 |
| Shipments (truck) | 1,104,655 | 1,016,845 |
| Stocks on hand | 215,000 | 163,000 |
| Unfilled orders | 800,000 | 900,000 |

*Four plants reporting: incomplete, one not reporting stocks on hand and one not reporting unfilled orders.

**Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.

## Big Rip-Rap Contract

TOBIN QUARRIES, Kansas City, Mo., in charge of work at Kingsley Dam near Lexington, Nebr., has been awarded the contract for rip-rap rock for the dam. The bid for the rip-rapping job was $2,839,940, including the cost of delivering 16,000 cars of rock from Wyoming, a total of 761,000 tons.


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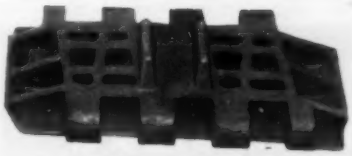

A SUPERIOR MANGANESE STEEL FOR . . . Wearing Parts in Crushers, Shovels, Pulverizers, Elevator and Conveyor Chains, Apron Feeders, and Ball, Rod and Tube Mills. It will pay you to investigate the use of ORO parts.

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under those bins and hoppers to regulate their discharge by rheostat control of rate of flow.

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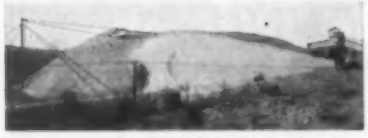

Small Sauerman Scraper machine, stores and reclaims seasonal surplus of 30,000 tons of screenings on rough ground alongside crushing plant.

This Sauerman Slackline Cableway digs down to the bottom of a deep gravel deposit and hauls the material to top of plant at cost of few cents per cubic yard.

LARGE savings in man-hours are effected by using Sauerman Drag Scrapers and Slackline Cableways in sand and gravel excavation, stockpiling and other material-handling jobs where the long operating range of these machines can be employed to advantage.

With one man at the controls, and with a relatively small expenditure of power, a Sauerman machine will dig, haul and automatically dump a large hourly tonnage of any class of earth or bulk material. Moreover, the cost of the equipment is moderate and upkeep is simple.

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SAUERMAN BROS., Inc., 530 S. Clinton St., CHICAGO 7


## Los Angeles Meeting A.I.M.M.E.

*(Continued from page 98)*

from the cyclone is returned through the circulating fan to the mill. Air which leaks into the system is vented and, since the cyclone is not a perfect dust collector, the vented air carries some dust with it. This illustration shows the application of hot gas to the system, the mill drawing the gas from the furnace. A separate vent fan has been added in this case to induce more drying gas from the furnace.

Fig. 2 shows a mill suitable for high-moisture materials. Swing hammers are surrounded with a solid periphery. Air and material enters at one end, works through the grinding chamber and is discharged through the fan into a cyclone. The hammers can atomize damp material. Bearings are water-cooled, hence high temperatures are practicable. The equipment illustrated will handle feed regardless of moisture. If maximum drying effect means air flow so high that a coarse product results, an air separator in closed circuit, as shown here, is used. Product fineness is then maintained without reducing air flow. Separator tailings are recycled, hence oversize particles are reground and given more drying time. Maximum practical size for a unit of this type has an evaporating capacity of about 2500 lb. water per hour. For greater capacity a cage type of mill is used.

Mr. Senseman showed many other slides depicting the development of dry grinding and the application of hot gases to the system, mentioning special adaptions where large quantities of moisture are involved, such as diatomaceous earth.

The most extensive use of mill drying is in pulverizing coal. The unit system of firing completely solves the dust problem. Hot air is used for drying and then as primary air for the burners. Flash drying, however, has its limitations. It is not practicable for abrasive materials. Generally speaking, a product finer than 30-mesh is required for successful operation. It cannot compete, on a cost basis, with cheap rotary dryers and calciners, where these machines are entirely satisfactory.

In conclusion, Mr. Senseman said that mill drying is today the accepted method of drying most damp solids used or marketed in dry powdered form. The logical development consists of designs representing a transition from a pulverizer with incidental drying effect, to a dryer with just enough pulverizing effect to break up agglomerations and promote rapid heat transfer. These latter machines are called flash dryers. They are now being used for drying materials as divergent in character as yeast and sewer sludge, clay and coal, diatomaceous earth and lead carbonate. Moisture content in the

feed runs from 1 percent to 80 percent. Some products are dried to only 15 percent as required, and others to zero.

Vent temperatures as high as 380 deg. F. have been used. For these metal machines today's maximum may be far below tomorrow's, if the development in high-temperature steels continues at the pace of the past few years. And experiments now being conducted, using ceramic-ware construction in the high temperature zone, point the way for calcining temperatures as high as 2000 deg.

## Industrial Minerals in Chemical Industry

HERBERT WATERMAN, acting head, Department of Chemical Engineering, University of Southern California, read a paper entitled, "Industrial Minerals in the Chemical Industry." The paper essentially was a compilation showing the percentages of industrial minerals used strictly in the chemical industry. Prefacing his remarks, Mr. Waterman pointed out the difficulties of such a tabulation because of the rather chaotic condition of the classifications of what constitutes a true chemical industry. The dividing line between such industries as metallurgical and chemical, he pointed out, is not always clear cut. For 1941 he gave a total limestone production of 12,303,830 tons produced of which 62.6 percent (7,605,060) was used in the chemical industries, such as alkali, carbide, magnesia, paper, pulp, sugar, etc. Other percentages in table, above.

## Spectro Chemical Analysis

The final paper for the first day was, "Spectro Chemical Analysis of Industrial Minerals," by MAURICE HASLER, Applied Research Laboratories. The author described the recent developments in the use of the spectroscope for both qualitative and quantitative chemical analysis. He pointed out that in recent years great accuracy has been possible by the adoption of photo-chemical means for appraising the relative strengths of the spectrum lines. He pointed out that the accuracy of such a method of analysis was about 2 percent of the total ingredient. To illustrate: if the material ran 10 percent CaO, the spectroscopic method of analysis could be expected to be within 0.2 percent (plus or minus) of that figure. Also it was shown that the spectroscope was especially accurate and reliable when dealing with amounts as small as one part in a million. For some of the rare minerals it afforded about the only reasonably cheap method of making an analysis.

For spectroscopic analytical methods, it was pointed out, that a complete report could be made in 20 to 30 minutes after receiving the sample provided proper standards were available. Thus for a cement manufacturer a complete analysis of a blending pulp could be had in a few minutes. Mr. Hasler, with the aid of slides, gave an interesting and detailed description of how the sample was prepared and the complete analysis made. He also showed a slide of "things to come" in this field where a complete analysis would be made in about one minute.

During the discussion it was asked as to the cost of these pieces of equipment, and it was stated that the present equipment would cost in the $7000 to $8000 range, and that future equipment would be about

| Commodity | Total Tons | Tons Used for Chemical Purposes | Percentage of Chemical Use |
|---|---|---|---|
| Limestone | 12,303,830 | 7,605,060 | 62.6 |
| Lime | 6,079,416 | 3,561,203 | 58.7 |
| Fluorspar | 308,405 | 52,674 | 16.4* |
| Barite | 490,833 | 246,987 | 50.5 |
| Phosphates | 4,688,312 | 3,470,404 | 74.0 |
| Crushed stone | 181,160,980 | 7,605,060 | 4.2† |

*For acid. †Largely limestone.

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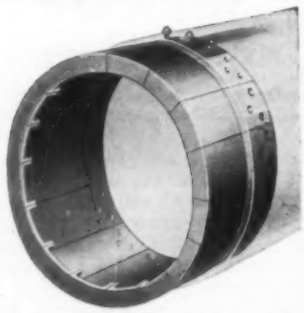

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double this figure. One spokesman said his company was making 15,000 to 20,000 melts per day and that it would be highly desirable to have a complete analysis of the melt before pouring it, hence an outlay of $20,000 for the more modern equipment would not be far out of line. It was also developed during the discussion that operators of the equipment need not be highly skilled, provided they had proper supervision. Mr. Hasler said that the average analytical technologist who had had a collegiate background should be able to handle all the details of such analysis after a few months training.

### Mining Limestone by "Caving"

The morning of the second day was under the chairmanship of S. H. DOLBEAR with J. CLARKE SUTHERLAND acting as co-chairman. The first paper, "A New Caving Procedure at the Crestmore Limestone Mine," by R. H. WIGHTMAN of the Riverside Cement Company was interesting and well received.

The Riverside Cement Co. started underground mining near Riverside, Calif., in 1927 using the block-caving method. The method consists essentially of completely cutting off from adjacent rocks a large block of limestone. These huge blocks are then allowed to cave or settle over prearranged chutes. When a block of limestone weighing upwards of half a million tons is allowed to cave under proper conditions, the crushing weight of such a mass breaks or crushes the mass into small enough sizes to be drawn through comparatively small chutes. Powder costs are usually low but development costs are relatively high. By development costs is meant the costs of driving a series of under-cut adits or tunnels under the mass, of cutting off the block on its four sides by suitable shrinkage stopes, and of preparing the raises and chutes from which the broken ore is withdrawn. The method has reached a high stage of development in the softer and more easily crushed copper deposits in Arizona and elsewhere, and the methods used at the Crestmore mine are an off-shoot of that technique. However, as Mr. Wightman pointed out in his paper, at Riverside it was found that by withdrawing the limestone in a certain sequence that the entire mass could be made to "rock" or teeter back and forth in such a manner as to considerably increase the crushing properties of the superimposed mass. The rocking of the mass was accomplished by drawing certain chutes so as to throw unusual strains in the mass and that only experience could tell one what chutes to draw to accomplish this condition. This phase of the paper was very unusual.

As many of the paper's hearers were essentially mining men, the paper brought out a considerable dis-

*(Continued on page 134)*

# INFORMATION

## TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

**You can obtain catalogs listed on these pages by merely checking and mailing the coupon below.**

1 BELTS—Chain Belt Co. has released a new catalog, Bulletin 437, descriptive of Rex Z-metal chain belts which are made in many styles, types and sizes for every kind of drive and conveyor service in sand and gravel plants, asphalt plants, cement mills, refractories, etc.

2 BLASTING—Hercules Powder Co. has released a new booklet describing and illustrating the advantages of using Spiralok, a cartridge with a spiral thread, in seismic exploration and in blasting river crossings for pipe lines.

3 BUCKETS — Blaw-Knox Division of Blaw-Knox Co. has released a 48-page booklet simplifying the problem of selecting the proper bucket to meet operating requirements when single drum hoists and hook-on applications are involved. The booklet also classifies the different types and their uses.

4 COMBUSTION CONTROL — Leeds & Northrup Co. has released catalog N-01P-163 describing and illustrating Type P combustion control designed especially for smaller industrial or municipal power plants. Schematic illustrations show the application of this system to different types of boilers, stoker fired, pulverized coal fired, gas fired, and oil fired. Typical installations are also pictured.

5 COOLERS — Fuller Co. has released Bulletin PMC-1, describing and illustrating 2-, 4- and 8-unit dry pulverized-material coolers for cooling finished portland cement. Also illustrated is the air-quenching inclined-grate cooler for quenching, cooling and drying granular materials.

6 CRUSHERS—Allis-Chalmers Mfg. Co. new 16-page bulletin No. B-61660 features design, operating principles and field experiences of blade mills, blowers, compressors, centrifugal pumps, concentration, control equipment, conveyors, converters, coolers, crushers, drives, dryers, feeders, furnaces, grinding mills, hoists, kilns, log washers, motors, power and electrical, pyro-processing, revolving scrubbers, roaster, screw washers, tractors, vacuum pumps, V-belts, and vibrating screens for crushing, mining and processing.

7 CUTTERS—Robert H. Clark Co. has published a new adjustable cutting tool catalog (No. 44) which contains complete specifications and prices, as well as detailed descriptions of the entire line of Clark cutting tools. Diagrams and photos of actual operations are also included.

8 DIESELS—Cummins Engine Co. has published two interesting booklets, entitled "Policy or Habit?" and "Threshold to the Future," which show how sound organization and clear thinking of management, labor, sales and service help Diesel owners to obtain maximum use from their engines and also how scientific research is helping to build a better Diesel.

9 DRILLS—Ingersoll-Rand Co. has published a 12-page bulletin, Form 4032, describing and illustrating Stopehamers for incline top slicing, shrinkage stoping, square set stoping, sub level stoping, horizontal cut-and-fill stoping and for driving drifts and crosscuts. Action photographs showing various applications of the Stopehamer are shown.

10 DUMP CARS—Pressed Steel Car. Co., Inc., has published bulletins 72-C, 72-D, 72-G, 72-I, 72-K, and 72-L, describing rolling trunnion automatic air dump cars; square box dump and quarry cars; self-discharge cars; cradle and rocker cars; running gear, bearing boxes, car parts and trucks; and track and track accessories.

11 ELECTRODES — American Chain & Cable Co., Inc., has issued a new informative book on Page-Allegheny stainless steel welding electrodes, containing helpful information on welding procedures and recommendations.

12 ELECTRODES — Allis-Chalmers Mfg. Co. new bulletin L-6348 describes arc welding electrodes of a-c and d-c types. Separate charts on physical properties of weld metal for each electrode are also included.

13 GRINDING WHEELS—The Carborundum Co. has prepared a 136-page reference book on grinding wheels entitled "Grinding Facts" that includes a complete explanation of the new marking symbols and gives a comprehensive schedule of grading recommendations for general, toolroom, diamond wheel, and thread grinding, also a description of each common type of grinding, safety rules, and a table of useful speeds.

14 TIRES—The B. F. Goodrich Co. has released a pocket-size 96-page Operators Handbook that helps operators select the right tire for the right job, provides vital facts and data about tires, rims and wheels, recommends procedure for proper care and maintenance of tires, and contains data on loads carried, air pressure, speed, matching of duals, load distribution, etc.

15 TRUCKS—The Euclid Road Machinery Co. has published a new book entitled "Bottom-Dump Euclids on the Move" which contains descriptions and actual operating views from construction and mining jobs in many parts of the country.

16 LOCOMOTIVES—Vulcan Iron Works has released Bulletin No. A-394 describing and illustrating saddle and side-tank locomotives. Specifications and haulage capacities are shown. Also included are Diesel and gasoline geared, Diesel-Electric, and tender-type locomotives.

17 LUBRICATION—The Farval Corp. has released a 16-page bulletin, No. 25, describing and illustrating the mechanical or centralized system of lubrication of bearings with the Manual Dualine system. Cutaway drawings in color show how the measuring valve operates. Construction and operation of both manual and automatic pumping units are also given, including application photographs on different kinds of machinery.

18 LUBRICATORS — Oil-Rite Corp. has released a new bulletin describing and illustrating the improved Style B general purpose constant level lubricator, a companion to the heavy duty Style J oiler. These lubricators are available in five sizes with capacities of 1, 2, 4, 8 and 16 ounces.

19 SCREENS — Allis-Chalmers Mfg. Co. new bulletin, B-6330, describes and illustrates low-head horizontal vibrating screens for wet or dry screening of sand, gravel, crushed stone, and various types of metallic and non-metallic ores.

20 SPEED REDUCERS—Link-Belt Co. has issued a new Book No. 1824 giving complete data on worm gear speed reducers. Dimensioned line drawings, engineering data, horsepower ratings, and tables of weights and dimensions are also contained in this book which replaces books Nos. 1524 and 1524-B.

21 X-RAY UNITS—Picker X-Ray Corp. has issued bulletin No. 1743 describing and illustrating 150 KV self-contained tube and transformer units, flexible shock-proof cable connected X-Ray units, automatic safety controls, high-powered transformers, processing tanks, etc. Dimensional data of the mobile and stationary units, technique charts for industrial radiography and catalog listings are also given.

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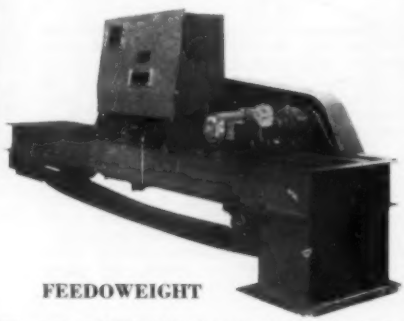

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## Los Angeles Meeting A.I.M.M.E.

*(Continued from page 132)*

cussion. The last block caved at Riverside was 210 by 260-ft. in cross section and 180 ft. high. This would give a tonnage of almost 500,000 tons. Blocks up to 270 by 310 ft. had been previously caved, this one being the ninth block caved to date. When asked as to the costs of such a method, Mr. Wightman was noncommittal. During private conversations, however, it was pointed out that the cement company had been in continuous operation for many years and was apparently successfully competing with close-by neighboring cement plants which quarried stone, so that costs must have been comparative to quarrying operations.

It was asked if large slabs or blocks of limestone did not come down intact and would plug the raises from which the limestone was withdrawn. According to the author this did not happen to any extent, and when it did happen it was a minor thing. When such a condition existed at one western metal mine, it was pointed out that dynamite was fastened to long poles and the powder shoved up under the offending boulder. Mr. Wightman said at his property such a boulder was first stulled up and the miner went up to it. As to the accident hazards, it was pointed out that the company had gone the last three years without a lost time accident. In his paper, Mr. Wightman gave many illustrations and drawings showing the details of block caving, and it was of timely interest to those who now are getting their stone from underground, or who in the future contemplate such a step.

### Non-Metallic Materials Used in Steel Industry

"Specifications and Sources of Non-Metallic Raw Materials Used at the Fontana Steel Plant," was the title of a paper prepared by CHARLES SEVERY, raw materials department, Kaiser Steel Company, and delivered by WALDEMAR F. DIETRICH, consulting engineer. The author discussed the requirements, tonnages, and specifications of the raw materials used at Kaiser's new steel plant at Fontana, Calif. It was stated that the plant uses about 12,000 tons of limestone per month. Limestone is secured from several sources. It usually has less than 1% $SiO_2$ although as high as 5% has been accepted. MgO must be under 5%. Sulphur and phosphorus must be below 0.1% and 0.05%, respectively. The rock as received for the blast furnace is of a slabby nature and is 1⅛-in. by 4-in. Open hearth stone is larger (5 by 8-in.). There is about 4000 tons of open hearth stone used per month, it was said. Some of the limestone comes from nearby cement quarries but some is also received from the

desert town of Chubbuck, Calif., a 140 to 150-mile haul. The latter rock is more uniform and desirable and not apt to be contaminated by acidic intruded rocks as is the case of nearer quarries. Other minerals used and amounts were as follows:

| | |
|---|---|
| Dolomite | 1000 tons per mo. |
| Fluxing clay | 7500 tons per mo. |
| Fluorspar | 200 tons per mo. |
| Moulding sands | 150 tons per mo. |
| Refractory sands | 50 tons per mo. |

### Lithium Production

"Wartime Demands Stimulate Lithium Production," a paper by LAWRENCE ROE of the American Potash and Chemical Corporation, is of interest as it brings out a point that editors of ROCK PRODUCTS have stressed many times and that is to know the exact chemical and physical characteristics of your products because there might be some ingredient in your product that is valuable and now lost. In this paper it was pointed out that lithium salts valued in dollars per pound were being produced from previously wasted materials. The amount in tons might be pointed to as small, but in this instance the developments at Trona, Calif., have caused it to become the leading producer of lithium salts in the United States. It was said, in fact, that this company now produces as much lithium (salts calculated back to metallic lithium) as all the rest of the United States combined.

It was also pointed out that the cost of these chemicals would probably drop, putting them in a position to find a wider use. One place that it was expected that lithium salts would find a wide application when the cost per pound becomes lower was in the refrigeration industry.

It also developed during the presentation of the paper that the lithium products were recovered by an adaptation of the soap flotation process, giving us another interesting application of this process to the needs of industry.

### China's Mineral Industry

The final paper of the morning session was "China's Industrial Minerals," by S. H. DOLBEAR, consulting engineer. This paper was a result of the writer's travels in China. He pointed out that the resources of China were as yet largely unknown but when one included Manchuria, now occupied by the Japs, which probably will be returned to China at the end of the present war, the mineral economic possibilities in China will be great. He advised any younger men who might be interested in foreign developments to go to China. His paper gave in tabulated form the amounts of industrial minerals produced per year and some data on potential tonnages.

It was interesting to note that China with all its millions produced in 1936 about 450,000 metric tons of portland cement. In this discussion it was pointed out that California alone had one plant that could produce more than that tonnage of cement, that a combination of six other plants could equal or better the production tonnages, and a combination of still two others could approach it. Fireclay, gypsum, fluorspar, etc., were similarly of a low tonnage when one considers China's vast population.

### Talc, Magnesite and Quartz

The afternoon session comprised five papers. The first, "Steatite Talc —Geology of Some Domestic Deposits," by BEN M. PAGE of the United States Geological Survey, pointed out that the deposits in the desert regions of California, Nevada and New Mexico were due probably to hydrothermal alterations of limestone, dolomites, granites and fillite. Quartz also played a part. He discussed in some detail, and showed by slides, the deposits now being mined for steatite talc in Inyo County, Calif., and in nearby mines in Nevada. The talc, he said, was found in a limestone area, parts of which had been altered by hot waters of uncertain origin. The best mines were associated with granitic intrusions and


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• Users everywhere are realizing the many profitable advantages of the Johnson Clamshell Bucket, the bucket that combines clean, fast digging with full protection against wear.

All-welded construction eliminates rivets, bolts, and other impeding projections, assuring best balance and better digging quality in all kinds of material.

Renewable lip edge-bar of tough manganese steel combats wear and is easily replaceable in the field.

Needle-bearing mounted closing sheaves permit free-running cable action at all times, bearings are sealed against entrance of dirt and moisture.

Lower sheeves are fully protected by heavy rugged steel plates. All sheaves have large diameter for increased cable life.

General purpose type, 1/2 to 1-1/2 yards capacity in stock for immediate delivery.

Johnson Bucket in open position showing heavy shock-preventing protection plate for lower sheave assembly.

Johnson Clamshell Bucket showing manganese steel teeth designed for smooth speedy digging.

*Write today for full information.*

The C. S. Johnson Company
Champaign, Illinois

with quartz dykes or outcrops playing an unknown role in the formation of the talc. He pointed out that steatite talc was finding a larger growing market for use in manufacture of high frequency insulation incidental to the war's needs.

The second paper, "Structural Features of a California Vein Magnesite Deposit," prepared by ALFRED BODENLOS, United States Geological Survey, was presented by his senior, EUGENE CALLAGHAN. The paper discussed the geology of the Red Mountain Magnesite deposits near Livermore, Calif. Following it was another paper on magnesite captioned, "Some Magnesite Deposits of Nevada," by CHARLES J. VITALIANO of the United States Geological Survey. He described the deposits at Gabbs Valley, Nevada, the source of magnesium of the Basic Magnesium, Inc., whose plant at Las Vegas, Nev., was until recently the largest producer of metallic magnesium in the United States if not in the world. Mr. Vitaliano pointed out that while this plant is now ceasing production, the large reserves of magnesium ores still at Gabbs Valley will remain a challenge to post war producers. He also stated that about 1,000,000 tons of magnesite had been removed by quarry operations along with a similar amount of waste. He estimated there was still 1,800,000 tons of ore in sight with 3,500,000 tons of probable ore and a far greater tonnage of lower grade magnesite.

The next two papers, "The Occurrence of Quartz Crystals and Optical Calcite in California," by CORDELL DURRELL, geologist of the University of California at Los Angeles, and the paper, "Unusual Features of the Geology of Dam Sites in Southern California," by JOHN P. BUWALDA of the California Institute of Technology, concluded the afternoon session.

During the evening of the second day the annual fall meeting dinner was held in the Embassy Room of the Ambassador Hotel. The Petroleum Division joined with the Industrial Minerals Section. The speaker for the dinner was F. S. CARPENTER of the United States Rubber Company. Mr. Carpenter spoke on synthetic rubber. He stated that this year there would be 775,000 tons of synthetic rubber produced, and this was as much as we ever used in one normal year. He said that synthetic rubber would be produced for as low as 10c per pound and that about 1,200,000 tons would be used the first year after the war. He felt that the field for a continued use of synthetic rubber will bring great post-war opportunities for industry.

## Washington News—Concrete Products Production

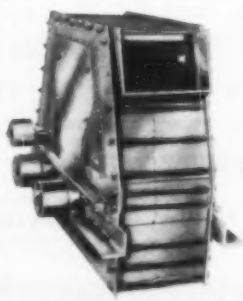
*(Continued from page 47)*

Sixty-one percent of 1943 reported production of concrete blocks was in the Central and Middle Atlantic states. Geographic distribution of production, by percentages, follows: 32 per cent—Illinois, Indiana, Michigan, Ohio and Wisconsin; 29 percent—Delaware, Maryland, New Jersey, New York and Pennsylvania; 19 percent—Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia; 16 percent—all states west of the Mississippi, except Montana (where no production was reported); 4 percent—the six New England states.

A more comprehensive survey of the industry on a quarterly basis, beginning with the third quarter, 1944, is now being made by the Bureau of the Census in cooperation with W.P.B., Division officials said. The survey is designed primarily to assist the war program, since shortages of some other building materials, especially lumber, are likely to continue. It will also be of assistance to the industry when peace-time building and construction operation are resumed, the officials added.

## Fire Walls of Concrete

CINDER CONCRETE PRODUCTS CO., Kansas City, Mo., has received a contract for the cinder block which are to be used by The Bowers Construction Co., for the erection of six firewalls in two warehouses at the Air Suppy Depot in Topeka, Kans.



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**New Holland Model 3030**

• Its astonishing efficiency reduces material from 30 in. to an optional minimum of 80% under one inch in one operation. Handles 100 to 150 tons per hr. with only 50 to 75 hp. For portable or stationary units. Combines expensive primary and secondary machinery in one operation. Write today for complete details on this new machine which operates on a new basic principle. Address Department RP-11.

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**GRUENDLER CRAFTSMANSHIP**

*On the.. Battlefront*

*Forward Base being constructed with crushed stone and gravel for the B-29 Super Fortresses.*

**Gruendler Portable JAW CRUSHERS**
**Preparing the Bases for the United Nations in China, India, Africa and Pacific Islands.**

These units must be sturdy, rugged and easy to operate with a minimum of maintenance. You will find these qualities coupled with top performance in every Gruendler Crusher.

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**CRUSHER *and* PULVERIZER CO.**
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## Baughman's New "Model C" Cinder, Chip or Lime Spreader

This Spreader is easily attached to any dump truck in a few minutes. Distributors always remain level — or can be tipped to any angle. **Spread remains near the ground.**

**Price $135.00 Complete, F. O. B. Jerseyville.**
**Net Weight, 173 Pounds.**

Manufacturers of the famous "Hi-Speed" line of Self-Unloading Equipment.

Model E, Belt Conveyor Type
Model D, Chain Conveyor Type
Model H, Wide Chain Type
Model F, Flat Bed Type
Model C, Cinder and Chip Spreader
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Ask for recommendations—we have a reliable distributor near you.

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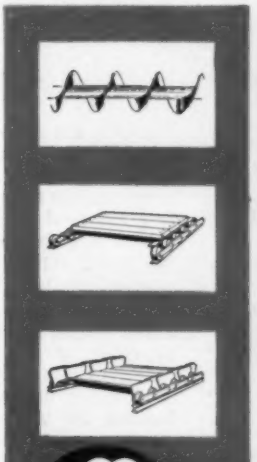
# For NON-STOP PRODUCTION

## *Rely on Jeffrey for Plans and Maintenance Parts*

Keeping production moving without a break is more important now than ever. Fast-moving production lines require dependable and sturdy equipment . . . the kind that Jeffrey builds.

Jeffrey not only furnishes the right maintenance items such as idlers, chains, elevator buckets, apron and spiral flights, sprockets and transmission machinery . . . but also can supply technicians and engineers to help you coordinate your material handling requirements into a smooth-running system.



The variety of use for Jeffrey conveyors, bucket elevators, feeders, screens, crushers and vibrating equipment is almost limitless. For good parts, for rapid delivery of all kinds of material, for a well-organized handling system—think of Jeffrey first.

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818 Cherry St. Phila. 7, Pa., U.S.A.
SINCE 1911 PRODUCERS OF
KNOX
Valves-Couplings-Nipples-Clamps-Menders

## Wedron Silica

(Continued from page 66)

the bins to a single bin which has spouts to the four tube mills. Calibrated adjustable valves at the mill feed end of each spout are the means of control for fineness of product. The mills turn at 23 r.p.m. and the flour discharges into a bucket elevator for storage and packing, in open circuit grinding, or is transferred to a screw conveyor to the air separator when 325-mesh product is desired. Rejects from the air separator return into the feed spouts of the mills along with fresh feed. Flour is packed by a 4-spout Bates bagging machine.

Close control is exercised over the grinding process and tests are made every hour from samples taken at the mill discharge and at the packing machine.

### Grinding Media

Close control is also maintained on the grinding media in the mills and additions are made on a daily basis. Ammeter readings on the motor drives indicate when, and approximately how much, additional grinding pebbles should be added.

High silica grinding pebbles and mill liners from both the Jasper Stone Co. and the Baraboo Quartzite Co. are being used, with very favorable results as compared to those imported from Denmark and France before the war. The load in a mill is 30 tons of 2-in. unrounded pebbles and the consumption averages ½ to ¾ ton per 24 hr. operation of a mill. When pebbles wear down to the size of a pea, they pass through the mill discharge grates but are recovered on a Hum-mer scalping screen and returned into the mill for re-passage until they ultimately become silica flour.

Liners are of 4- to 6-in. block cemented in place by high early strength portland cement. When they are worn down to 1-in. thickness they are removed and new linings inserted. Relining is done on an average every eight months.

Flour discharging from the mills is conveyed by screw conveyors into a belt bucket elevator. The high temperature of the flour has proven detrimental to the belting, causing it to stiffen, become hard and crack. Belting life was only three or four months under this service. To withstand the high temperature, Victor Balata belting with an asbestos covering on the bucket side has been substituted and Grip-on safety pulley lagging has been placed on both pulleys. This belting is 4-ply cotton canvas-stitched with a 2-ply asbestos cover. Service from synthetic rubber belting and liners in the plant has, with this exception, held up favorably compared with pre-war natural rubber according to the plant superintendent.

Dust collection has not been overlooked in all this plant expansion and the collection capacity and efficiency have been materially improved. All the dry screens and chutes are completely enclosed and dust collection hoods have been constructed at all transfer points in the entire plant. Every source of dust generation has been considered in installing a dust collection system.

### Dust Collection

A Parsons oval bag, cloth filtering type dust arrestor has replaced smaller units in connection with the screening plant and an identical collector handles the dust from the grinding plant. Both collectors have automatic rappers to facilitate dust removal from the bags. Dust recovered from the screening plant collector is wasted, but dust collected from the grinding plant is returned into the mills with the incoming fresh feed.

John A. Dummett, superintendent, has been in charge of operations since the plant was rebuilt after destruction of the original plant by fire in 1920. Fred Hanna is assistant superintendent. A. Warsaw is president of the company; N. H. Crissey is vice-president and secretary; and E. F. Swift, Jr., is treasurer.

## Cut Mica Purchases

Colonial Mica Corporation has announced to producers in the North Carolina area that after the first of the year only full trimmed Muscovite ruby sheet mica of specified size and quality will be purchased. Miners of the Spruce Pine area have lodged energetic protests at this contemplated action. For the period from January through March, domestic mica, fully trimmed of the Muscovite ruby sheet type, large enough to cut one and one-half inches by two inches or larger of first and second domestic quality will be purchased for $8 a pound, and domestic punch mica will be bought for 30 cents a pound.

It was explained that mica such as green and black stained mica will be eliminated from the program and sheet mica too small to fulfill the specifications will be purchased in the form of punch sheet mica.

Present existing specifications determining quality, full trim and size will continue in effect, it was announced.

## Magnesite Data

On page 90 of the October issue of Rock Products there was a news item entitled, "Increase Magnesite Production" which mentioned the increase in production facilities of the Northwest Magnesite Co. The Bureau of Mines figures referred to in the news item cover annual production for the entire United States and not solely the Northwest Magnesite Co., as may be inferred.

# When we leave the WARPATH-

*Get off to a Good Start with* **LIMA.** When Victory is ours and we leave the warpath you will be needing new shovels, cranes and draglines for the big jobs that are now being held in abeyance. When that time comes LIMA will be ready to give your excavator and crane requirements undivided attention.

Faster, safer and more efficient LIMA shovels, cranes and draglines will be available through the use of new material, new methods of manufacture and experiences gained from war time service. The many new advantages to be offered by LIMA will help you make more profit through greater output on the big jobs coming up.

## LIMA LOCOMOTIVE WORKS, INCORPORATED

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WORLD'S BEST 3RD AXLE

***CARRIES*** two payloads in one.
***SAVES*** in first cost (up to 40%), on insurance (up to 50%), fuel costs (up to 20%), tires (50% to 100% longer life), road time (up to 20%), breakage of fragile loads, license fees, dead weight, maintenance costs.
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# HAYWARD BUCKETS

**WON'T QUIT OR CAUSE TIME OUT**

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

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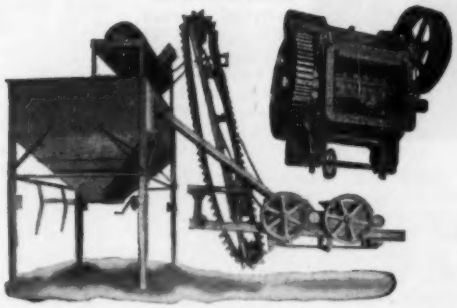
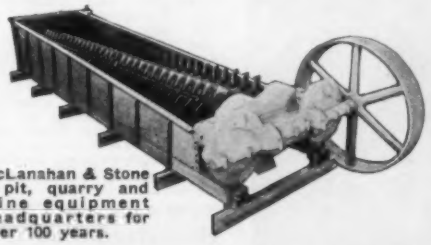
# McLANAHAN

SCREENS • CRUSHERS

COMPLETE PLANTS



McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans — steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, and hoists—complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any material.



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**McLanahan & Stone Corp.** *Established 1835* HOLLIDAYSBURG, PENNSYLVANIA

## Sand Recovery

(Continued from page 55)

the plus 16-mesh material from 40 percent of the feed and to save the plus 16-mesh to add to the remaining 60 percent of bank material. We will see if this solves the problem satisfactorily. However, if the throughs of the 16-mesh screen were put into a sand settling or thickening device, as described in the article in the November issue, and the fines (the minus 50-mesh) also saved and returned to the concrete sand, a better sand might result.

Here's what the producer proposes:

His bank sand has 83 percent passing 16-mesh. Of this there should not be, for good concrete sand, more than 75 percent. Now 40 percent of 83 percent is 33.2 percent, so he proposes in effect removing or wasting one-third of his original material in the minus 16-mesh sizes.

The original bank sand is split two ways—60 percent to be used as is, and 40 percent to be stripped of the minus 16-mesh. Our 60 percent basic sand with the new coarse added would now have the following analysis:

| | Parts | Parts |
|---|---|---|
| Plus 4-mesh | 0.9 + 0.6 = | 1.5 |
| 4- to 16-mesh | 9.3 + 6.2 = | 15.5 |
| 16- to 50-mesh | 42.0 + 0.0 = | 42.0 |
| 50- to 100-mesh | 7.2 + 0.0 = | 7.2 |
| Minus 100-mesh | 0.6 + 0.0 = | 0.6 |
| | 60.0 | 66.8 |

Reduced to percentages, the new sand would have this analysis:

| Percent Sizes | | Percent Passing |
|---|---|---|
| Plus 4-mesh | 2.2 | 97.8 |
| 4- to 16-mesh | 23.2 | 74.6 |
| 16- to 50-mesh | 63.0 | 11.6 |
| 50- to 100-mesh | 10.7 | 0.9 |
| Minus 100-mesh | 0.9 | |
| | 100.0 | |

This gradation, plotted as the full line in the chart, Fig. 8, shows that we now have an excellent concrete sand. It possibly could be improved a bit by recapturing the fines from the discarded one-third minus 16-mesh material now diverted to plaster or mortar sand, but these fines may be more necessary in the plaster sand than in the concrete sand to make a saleable product.

### Conclusions

This problem is particularly interesting because it is solved by screening only. The use of vibrating screens, properly installed and operated, will doubtless solve many similar problems as readily as hydraulic classification, which was the process described in the solution of the problem in the November issue. We intend to go into this subject of screening sand in more detail later.

Here it may be stated as a matter of everybody's experience in screening sand that to do an effective job, sand should be either dry or saturated. It is most difficult to screen damp sand. Hence the use of plenty of water sprayed well over the entire screening surface, and directed at such an angle as to be most effective is essential. This is not always vertically downward, for the chief reason for using the water sprays is to avoid blinding, and the most desirable angle of application may vary with the slope of the screen, the amplitude of vibration, with-flow or counter-flow vibration, etc.

The analysis given is based on the assumption of 100 percent efficiency in screening at 16-mesh, which of course is not possible, although 90-odd percent is claimed by screen manufacturers. Efficiency in this kind of screening is obviously important, because anything less than 100 percent would mean screening something more than 40 percent of the raw material and wastage of more than one-third of the whole in this case.

The only alternative that producer has in this case, that we can see, would be to crush some of his gravel to increase both his coarse sand and his fines.

## Grant Quarry Permit

Macco Construction Co. has been granted a limited permit to operate a quarry off the Tunnel Road in Oakland, Calif. The company was granted the permit to fulfill its contract to deliver 180,000 tons of fill for the new army "In-Transit Supply Depot" in this area. About 130,000 tons have been delivered and the company has promised to take all the fill from one slope and replant grass seed, brush and trees.

## To Build Crushing Plant

The Azusa Rock and Sand Co., Azusa, Calif., is planning to build a new crushing plant in the near future immediately adjacent to the site of the present plant.


WHEN GERMANY FALLS
CONSTRUCTION STARTS
Prepare NOW for big business in CONTROLLED CONCRETE

Install [SC]2 PRECISION CONCRETE CONTROL It Includes

Moisture Meter
Makes a test for moisture content of sand or stone in ONE minute. Accurate to ¼ per cent.

Compensator
Delivers correct DRY weight of aggregates and ADDED water. Makes a graph record of EVERY BATCH.

[SC]2 CONTROL produces uniform concrete. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "Profits in Concrete."

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STEELGRIP Standard Rigid Arm Gear and Wheel Pullers are of improved design. Will not slip from work. Arms are forged and heat-treated. 2-arm, 3-arm and special models. 12 types and sizes. CHAINGRIP Universal Pullers pull wheels, solid gears, pinions, etc., even at considerable distance from end of shaft. Proof-tested chains have both chain hooks and special pulley hooks. 3-ton and 12-ton capacities.

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Division of The Fate-Root-Heath Co. • PLYMOUTH, OHIO, U. S. A.

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*Chemicals—Metallics—Non-Metallic Minerals*

**The new model GAYCO Centrifugal air separator makes possible the uniform and increased recovery of fine material within a range of 40 to 400 mesh.**

- **Greater Capacity**
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- **99% Through 325 Mesh**
- **25% to 30% greater recovery of fines.**
- **Not affected by variation in speed or rate of feed.**

**Manufacturers also of "Reliance" Crushers, Screen, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening and washing plants for crushed stone, sand and gravel.**

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**FACTORY & LABORATORY, KINGSTON, N. Y.**

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*WRITE TODAY FOR BULLETIN F-100* that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

**FLEXIBLE STEEL LACING CO.**
**4684 Lexington St., Chicago, Ill.**

**FLEXCO HD BELT FASTENERS**
Sold by supply houses everywhere

Our large, modern plant is tooled-up to take care of your Gear orders whether large or small—any quantity—any material—any size. We also produce Sprockets for Roller and Silent Chain Drives.

We are noted for our precision workmanship, minute inspection, quality and dependable service.

**P.S. We maintain a large, precision surface grinding department and can offer you time on our production machines. Ask for details.**

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Reductions in operating costs will be mighty welcome during the competitive post-war years. If rail haulage is a part of your set-up, you will find Davenport Locomotives a major source of profit-increasing economies.

Take the case of Mr. V. O. Johnston, President of the Lincoln Sand & Gravel Co. He reports a savings of better than $25.00 per eight-hour day from his 44-ton Davenport Diesel-Electric as compared with steam operation.

Now is the time to marshal the facts about modern haulage "The Davenport Way." Our engineers will welcome a description of your haulage conditions and will gladly submit reliable recommendations—all without obligation.

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## DAVENPORT LOCOMOTIVE WORKS

A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

## "Synthetic" Molding Sands

SOME RECENT STUDIES by the Bureau of Mines of the clay content of 22 natural molding sands from the United States, Canada, and Scotland indicate that many domestic clays can be used successfully to produce synthetic sands needed in making castings for war equipment, according to Report of Investigations 3774, "The Composition and Properties of Molding Sands—Part I. The Nature of the A.F.A. Clay Fraction Removed from Natural Molding Sands." This report may be obtained free from the Bureau of Mines, Department of Interior, Washington, D. C.

By determining the composition and other characteristics of the clays found in well-known commercially used natural molding sands, the Bureau has helped clear the way for selecting the proper clay to mix with sand to produce synthetic molding sands.

Natural molding sands are those in which the correct proportions of sand and bonding clay occur naturally, while synthetic molding sands are created by adding suitable clay to pure sand of the proper size distribution. The development of a successful synthetic molding sand does not result from guesswork, but involves the careful blending of the correct sand, in exact proportions, with the proper type of clay.

The research was conducted in carefully controlled tests at the Bureau's Southern Experiment Station at Tuscaloosa, Ala., by Louis H. Berkelhamer, mineral technologist, in cooperation with the University of Alabama. These tests and their results are described in a formal report just released by Dr. R. R. Sayers, Director of the Bureau.

Samples tested were provided by an Alabama foundry and a foundry sand distributor of Evansville, Ind. Domestic molding sands used in the experiments came from deposits in Alabama, Tennessee, Arkansas, Indiana, Illinois, Michigan, Ohio, New York, and California. Clays recovered from the 22 samples were studied by chemical, petrographic, X-ray diffraction, and differential thermal analyses as well as dehydration and rehydration tests.

Mr. Berkelhamer concludes that, in general, the bonding material found in natural molding sands is similar in composition to many clays, such as refractory shales, low-grade fire clays, or high-grade fire clays.

## Increase Talc Production

SIERRA TALC CO., LOS ANGELES, CALIF., is making improvements at its mine near Talcton, Nev. A 1000-ft. tunnel will be driven 700 ft. below the ridge now being mined, through which ore will be handled. Ferris Booth is president and Chester O. Best is vice-president in charge of production.

## Granite Aggregate

H. E. FLETCHER CO., West Chelmsford, Mass., has issued a very instructive bit of promotional literature in a letter-size 4-pp. folder. While primarily intended to promote the use of crushed or pulverized Chelmsford granite for fine aggregate, evidently for architectural concrete, the data given are comprehensive enough to suggest other possible uses.

First is given a table of physical characteristics, toughness, abrasion loss, specific gravity, etc. Then follows a mineralogical analysis by optical methods. The center spread of the folder contains charts on the screen analysis on both arithmetical and logarithmic charts, from 14-mesh to 400-mesh (Tyler series).

The fourth page contains descriptive matter on the screen test and how the samples were obtained and reduced to a 500-gram sample. The samples were taken on clean plates held beneath the finest mesh screens. Then there is the tabulation of the screen analysis. This is interesting since it shows 16.59 percent passing 400-mesh.

It is stated that 50 percent of the constituent mineral grains are liberated at minus 80-mesh and 90 percent at minus 115-mesh. In the case of 100 percent minus 100-mesh, the mineral composition shows:

| | |
|---|---|
| Iron oxide | 1.20 percent |
| Calcium oxide | 0.70 percent |
| Magnesium oxide | 0.09 percent |
| Sodium oxide | 2.27 percent |
| Potassium oxide | 4.44 percent |

These are all essential fertilizer or plant-food minerals and add up to nearly 9 percent. In addition there is about 0.2 percent of phosphorus pentoxide, which is not freed until the granite is ground to minus 200-mesh. When ground to minus 200-mesh 2.2 percent of titanium oxide can also be freed. The other 89 percent is silica (75 percent) and aluminum oxide.

To those interested in the possibilities of recovering valuable industrial minerals by flotation from common rocks these analyses should be most interesting.


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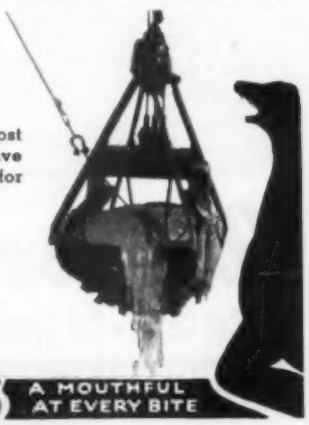

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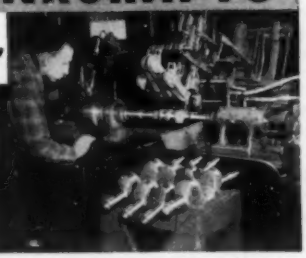
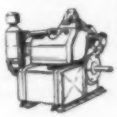
SUPER-FINISHED **CRANKSHAFTS**

another *"PLUS FEATURE"* IN ALL **WISCONSIN** *Air-Cooled* **ENGINES**





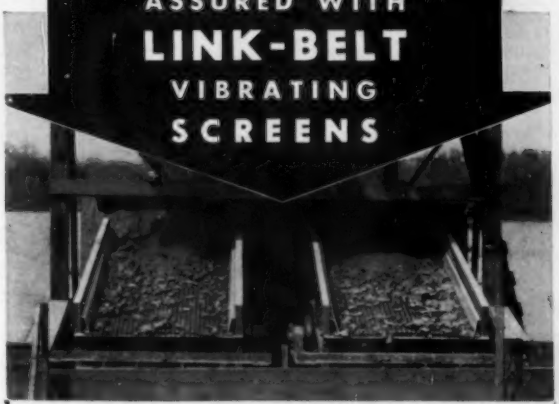
The very ingenious, specially designed machine illustrated above, puts a mirror-smooth *superfinish* on the crank-pins of all Wisconsin Air-Cooled Engines. By combining perfectly synchronized rotating and oscillating polishing movements, absolutely uniform diameter is maintained over the full length of the crankshaft bearing surfaces.

This is just another of the many small, but *important production details* that account for Wisconsin heavy-duty serviceability and smooth, efficient operation. Just another reason, too, why *your equipment* should be powered by a Wisconsin Engine.

Most H.P. per pound **WISCONSIN MOTOR** Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
*World's Largest Builders of Heavy-Duty Air-Cooled Engines*



**JOB-TESTED PERFORMANCE** ASSURED WITH **LINK-BELT** VIBRATING SCREENS



● Whether the work calls for sizing, dewatering or recovering all kinds of wet or dry materials, you can depend on Link-Belt Screens to do the job. They are known for their high efficiency and low-cost operation, the result of over 20 years' experience in the design, manufacture and application of screens of all types. Made in a number of standard sizes—single or multiple decks, with or without enclosures, for light, heavy or extra-heavy duty. Complete data given in Books 1762 and 1977. Specify Link-Belt and be assured of "job-tested-performance."

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*LINK-BELT Vibrating SCREENS*

*EVERYTHING IN*

**POWER TRANSMISSION**

**AND**

**CONVEYOR SUPPLIES**

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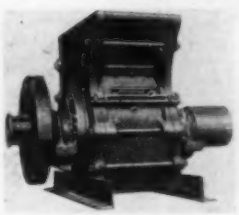
129 GRAND ST. NEW YORK 13, N. Y.



**LOWER LIME PRODUCTION COSTS**



**GILSON PULVERIZERS**

. . . reduce idle machinery time to the absolute minimum! The GILSON No. 22, shown here, can be operated either as a Pulverizer or Crusher. Adjustments can be quickly made without removing any major parts. On transient jobs load handling costs can be reduced by moving the unit to the job. The GILSON No. 22 is easy to move and easy to service, yet ruggedly built to meet exacting material specifications of hard quarry service. You can't go wrong with a GILSON.

Most accessible pulverizer built.

Low maintenance cost—all parts subject to wear readily accessible.

Low power cost—requires only 125 H.P. to operate at full capacity.

Built in 5 sizes of 3 to 40-ton hourly capacity for every production purpose.

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Send now for complete details in descriptive booklet.

**GILSON BROS. CO.**
FOUNDRY & MACHINE WORKS • FREDONIA, WISCONSIN

# Financial

RECENT DIVIDENDS

| | | |
|---|---|---|
| Canada Cement Co., Ltd., pfd. | $1.25 | Dec. 20 |
| Canada Crushed Stone, Ltd. | .10 | Dec. 20 |
| National Gypsum Co. pfd. | 1.12½ | Dec. 1 |
| Schumacher Wall Board Corp. | .25 | Nov. 15 |
| Schumacher Wall Board Corp. pfd. | .50 | Nov. 15 |
| U. S. Gypsum Co. | .50 | Dec. 30 |
| U. S. Gypsum Co., 7% pfd. | 1.75 | Jan. 2, 1945 |
| U. S. Potash Co. Com. (np) | .50 | Dec. 26 |

•

PENNSYLVANIA GLASS SAND CORPORATION, Lewistown, Penn., had a net profit of $416,891 for the nine months ended September 30, 1944. This compares with $470,416 for a similar period in 1943.

•

FLORIDA PORTLAND CEMENT CO., Chicago, Ill., with plant near Tampa, Fla., reports a net income of $304,588 for the nine months ended September 30, 1944. This compares with $436,664 in the corresponding 1943 period.

•

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., presents the following report for the nine months ended September 30:

| | 1944 | 1943 |
|---|---|---|
| Gross sales | $4,423,747 | $4,781,250 |
| Cost of sales | 3,536,131 | 3,762,925 |
| Other income (net) | 49,636 | 76,474 |
| Depreciation | 200,592 | 208,588 |
| Provision for federal taxes | 156,175 | 224,256 |
| Net after all charges | 215,918 | 302,994 |
| *Net per share | 0.38 | 0.55 |

*Based on 555,947 shares outstanding 1944 and 556,265 shares 1943.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., had a net profit of $709,961 for the 12 months ended September 30, 1944 as compared with $1,551,990 for the same period ended September 30, 1943.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., reports the following earnings for twelve months to September 30:

| | 1944 | 1943 |
|---|---|---|
| Net sales | $4,853,183 | $7,646,163 |
| Operating expenses | 4,619,293 | 5,986,645 |
| Depreciation and depletion | 461,386 | 945,025 |
| Operating profit | d227,495 | 714,493 |
| Other income | 144,573 | 96,344 |
| Total income | d 82,922 | 810,836 |
| [1]Income charges | 49,614 | 31,810 |
| Federal income tax | | 280,572 |
| Wartime reserve | | 200,000 |
| Net profit | d132,537 | 298,455 |
| Common dividends | 591,356 | 919,085 |
| Def. for periods | 723,893 | 620,630 |

[1]No liability incurred for excess profits taxes.

•

LONE STAR CEMENT CORPORATION, New York, N. Y., has presented the following consolidated earnings statement for the nine months period to September 30:

| | 1944 | 1943 |
|---|---|---|
| Sales | $21,118,831 | $23,063,795 |
| Manufacturing, etc., cost | 14,157,293 | 13,918,930 |
| Selling expense, etc. | 2,021,676 | 2,064,402 |
| Depreciation and depletion | 1,505,640 | 1,617,551 |
| Operating profit | 3,434,222 | 5,462,912 |
| Other income | 326,989 | 273,891 |
| Total income | 3,761,211 | 5,736,803 |
| Income and profit tax | 850,407 | 2,534,729 |
| Other taxes | 887,022 | 677,349 |
| [1]Misc. charges | 481,050 | 515,877 |
| Net profit | 1,542,732 | 2,008,848 |

[1]Includes provisions for doubtful accounts and contingencies.

Note: Results of foreign subsidiaries included above are figured at average exchange rates, except as to provision for depreciation and depletion, which is based on dollar value of fixed assets at time of acquisition.

•

NATIONAL GYPSUM CO., Buffalo, N. Y., reported consolidated earnings for nine months ended September 30:

| | 1944 | 1943 |
|---|---|---|
| Net sales | $18,479,232 | $16,105,528 |
| Costs and expenses | 16,441,750 | 13,910,814 |
| Depreciation, depletion, etc. | 740,423 | 720,529 |
| Doubt. accts. res. | 20,557 | 45,685 |
| Net operating profit | 1,276,502 | 1,428,500 |
| [2]Other income | 261,550 | 237,895 |
| Total income | 1,538,052 | 1,666,395 |
| Interest, etc. | 140,853 | 148,798 |
| Misc. deductions | 54,644 | 31,771 |
| Inc. and prof. tax | 628,100 | 799,800 |
| Net profit | 714,455 | 686,026 |
| [1]Times chg. earn. | 10.53 | 10.99 |
| Earn., pfd. share | $10.99 | $10.56 |
| No. of pfd. shares | 64,980 | 64,980 |

[1]Before income and profits taxes.

[2]Includes fees earned under cost-plus-fixed-fee contracts: 3 mos., $52,500 (1943, $38,414); 9 mos., $156,048 (1943, $141,529).

•

UNITED STATES GYPSUM CO., Chicago, Ill., reported a net profit of $3,193,674 for the nine months ended September 30, 1944, as compared with $3,873,089 for a similar period in 1943. The quarterly statement of net profit for the period ended September 30, 1944, showed earnings of $1,023,408 as against $1,227,264 for a like period a year ago.


SPECIFY MACWHYTE PREformed

...the Correct Rope for your equipment

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ROCK PRODUCTS OPERATORS

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- Made from selected steels
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SURE BILL—BUY 'CLEVELAND'-WE DO!"

Tough, Durable, Accurate Wire Screens for Vibrators or Rotary Jackets

*Cleveland is the "Buy" Word of Quality*

THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 78TH STREET CLEVELAND, OHIO

## NEW AND USED EQUIPMENT

### Air Compressors

1—Ingersoll-Rand Duplex Air Compressors. Type XB 582 cu. ft., motor driven.

1—Ingersoll-Rand Imperial. Type XB-2, Duplex Air Compressor. 12" x 7½" x 12".

### Coolers and Dryers

1—7 x 56 ft.; 1—10 x 90 ft. & others.

### Cranes and Shovels

1—P & H 1-yd. **SHOVEL**, Gasoline, Reconditioned.

1—**LOCOMOTIVE**, 4-wheel, 10-ton, 25' boom.

### Crushers

2—No. 5 Gates **GYRATORY CRUSHERS**, Style D.

Others—Various types and sizes.

### Diesel Generators

1—Diesel Generator Set, 300 HP, Fairbanks-Morse Diesel, 6 cylinder, Model 32, complete with auxiliaries. 257 RPM., direct connected to a 250 KVA Fairbanks-Morse Generator, Type D, 3 phase, 60 cycle, 230 volts. V-belt drive to exciter. Complete with panelboards, etc. And Others.

### Drilling Equipment

1—No. 40 I-R **DRILL SHARPENER** and Accessories.

1—No. 38 I-R Leyner **DRILL SHARPENER.**

1—Improved type No. 22 electric power Loomis Machine **CLIPPER DRILL**, with motor.

### Grinding Equipment

3—5½ x 20' F. L. Smidth **TUBE MILLS.** And Others.

2—5½ x 22' Allis-Chalmers **COMPEB MILLS.**

**WEBBER EQUIPMENT CO.**
**17 East 45th Street**
**New York 17, N. Y.**

### Hoists

1—S. Flory Mfg. **SINGLE DRUM HOIST.** Handles 11-ton car up 13% grade 500 ft. per min.

### Kilns

1—8 x 9½ x 180 ft. and Others.

### Locomotive and Cars

1—4-ton Vulcan Iron Works. Class AW-4, Worm Gear **GASOLINE LOCOMOTIVE**, 36" gauge.

6—5-yd. Koppel 2-way **DUMP CARS**, 36" gauge.

### Hammer Mills

2—Ajax Hammermills, size SXT-11 (1-R.H., 1-L.H.). Handles stone 300 tons per hr. 8" to 1½" each. Also spare parts.

1—Williams No. 6 Hammermill.

### Elec. Motors & MG Sets

Large stock, rebuilt, AC or DC, 25 and 60 cycle.

### Road Roller

1—Austin-Western "Autocrat" 10-ton with compressed Air Scarifier. New 1941. Gasoline.

### Air Separator

1—14 ft. Sturtevant Air Separator. New 1941.

### Magnetic Separators

3—Stearns High-Duty Magnetic Separators, 24" dia., 48" face. New 1939 and 1940.

### Track Scale

1—Homestead (Carnegie - Illinois Steel) Standard Track Scale, 40'-100 ton capacity. Complete.

### Turbine

1—100 HP Westinghouse Turbine, 2700 RPM. direct connected to 100 HP Westinghouse Gear Reducer. Ratio 3 to 1.

FASTEST POURING
Almost Any Job of Concrete Can be Done Faster with JAEGER TRUCK MIXERS
"HIGH DUMP"
Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.
or "LOW CHARGE" TYPE
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Mixers—Pumps—Hoists
Paving Equipment

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No time and money lost in production tie-ups when you use Hendrick Perforated Plate! The full clearance from top to bottom prevents clogging—permits faster, more efficient screening. Hendrick Perforated Plate is promptly supplied in any size and shape of opening—round, square, "squaround," hexagonal, slotted or special type—and in all commercially rolled metals, flat or corrugated. Write for full data.

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SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types. Mitco Open Steel Flooring. Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

## Write Headquarters for the Catalog You Need

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**No. 1606**—Blaw-Knox Buckets for Contractors.

**No. 1696**—Blaw-Knox Buckets for Single Drum Hoists for use on Railroads. Mills, Foundries, Etc.

**No. 1745**—Blaw-Knox Buckets for "Burtoning" handling Nitrates, Grain, Potash, Etc.

**No. 1757**—Blaw-Knox 2 Line Lever Arm Buckets for Rehandling, Barge Cleanup, General Purpose, Hard Digging, Dredging.

**No. 1865**—Blaw-Knox 4 Rope Buckets for Coal, Ore and Cleanup.

**BLAW-KNOX DIVISION of Blaw-Knox Company**
**2035 Farmers' Bank Bldg., Pittsburgh, Pa.**

## New Incorporations

**Pepper Box Mica Corp.**, Wilmington, Del., has been organized for the purpose of mining, smelting, etc., with a capital of $25,000. Principal office, Colonial Charter Co.

**Batesville Limestone Co.**, Batesville, Ark., has been incorporated to mine and sell limestone and lime products, with a capital of 10,000 shares of stock, par value $1 a share, and beginning capital of $600. Incorporators are Horace Jewell, N. B. Murphy and J. L. Owen, all of Little Rock, Ark. J. W. House, 1014 Boyle Bldg., is resident agent of the company.

**Ready Mixed Concrete Co.** (Colorado), 1318 Continental Bank Bldg., Salt Lake City, Utah, has been organized to manufacture and sell ready mixed concrete, with a capital stock of 2000 shares, no par value. 2000 shares subscribed. President, Frank P. Spratlen, Jr.; vice-president, Donald S. MacDougall; secretary, Florence E. Fry.

## Manufacturers' News

**The Lincoln Electric Co.**, Cleveland, Ohio, announces that W. R. Persons, Pittsburgh district manager, has been transferred to the factory and main office at Cleveland to carry out a special post-war planning assignment.

**The Euclid Road Machinery Co.**, Cleveland, Ohio, announces the appointment of The G. W. Van Keppel Co., 2440 Pennway, Kansas City, Mo., as authorized Euclid distributor in that territory.

**Mt. Vernon Car Mfg. Co.**, Mt. Vernon, Ill., a division of H. K. Porter Co., Inc., Pittsburgh, Penn., announces the appointment of George Green to the position of vice-president in charge of sales.

**H. K. Porter Co., Inc.**, Pittsburgh, Penn., has appointed Victor Failmezger to the position of sales manager of its subsidiary, Quimby Pump Co., Newark and New Brunswick, N. J.

**The Foxboro Co.**, Foxboro, Mass., announces the addition of Frank Renner to the staff of sales engineers covering the southern California territory, with headquarters at 2307 East 8th St., Los Angeles 21, Calif., also the addition of Robert Beers to the staff of sales engineers attached to the New York office, with headquarters at 420 Lexington Ave., New York 17, N. Y.

**United States Rubber Co.**, New York, N. Y., has announced the appointment of Herman A. Everlien as general sales manager of the mechanical goods division, and Walter F. Spoerl as merchandise manager. Both positions are newly created. Mr. Everlien has had more than 41 years' experience in the mechanical rubber goods industry. He began his career as chief clerk in the sales department of the old Revere Rubber Co., Chicago, later consolidated into the United States Rubber Co. Mr. Spoerl started his career in 1908 as chief clerk of the Revere company and later became assistant manager. From 1934 until the present promotion he has held an executive sales position in the New York office.

Herman A. Everlien

Walter F. Spoerl

**Mack Trucks, Inc.**, New York, N. Y., has appointed William P. Michell as assistant chief engineer. Mr. Michell recently returned from Great Britain where he had been serving in an advisory capacity on military truck transport at the invitation of the British government.

**Lima Locomotive Works, Inc.**, Lima, Ohio, has announced the promotion of Henry Barnhart, formerly manager of the shovel and crane division, to vice-president in charge of shovel and crane division; also the appointment of Albert Jay Townsend, formerly chief mechanical engineer, as vice-president in charge of engineering.

**Westinghouse Electric & Mfg. Co.**, Pittsburgh, Penn., announces the appointment of B. M. Brown as manager of the petroleum and chemical section of the industrial department, to succeed Q. M. Crater, who has been transferred to the Detroit, Mich., office of the Industrial Department as assistant manager.

**United States Rubber Co.**, New York, N. Y., has agreed to purchase the assets and business of the L. H. Gilmer Co., Philadelphia, Penn., manufacturers of industrial V-belts, according to an announcement by Herbert E. Smith, president of the rubber company. No change in the management or operations of the Gilmer Co. is contemplated. John S. Krauss, president, will continue in the active management of this business.

**Kropp Forge Aviation Co.**, Chicago, Ill., has appointed J. E. White, project manager in charge of construction, procurement and equipment for the new plant, as sales engineering representative for the northern part of Illinois, with headquarters at Rockford, Ill.


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MULTI-WALL PAPER BAGS
HAMMOND Betterbags WELLSBURG, W.VA.
Sewn and Pasted Open Mouth and Valve Paper Bags.
Your Inquiries Invited.
WRITE TODAY!
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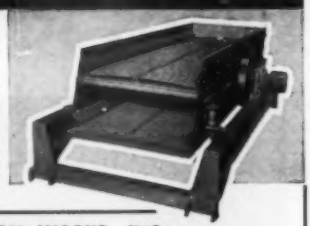
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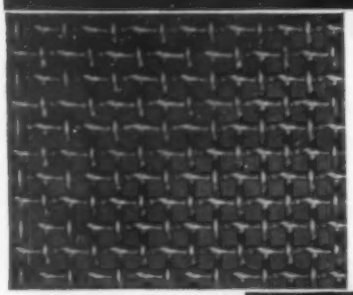
THE TYLER TRADE MARK REG. U. S. PAT. OFFICE DOUBLE CRIMPED

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., has appointed R. W. Davis, formerly assistant manager of the electrical department, Milwaukee, as general manager of the Norwood, Ohio, works.

**The Rust Engineering Co.**, Pittsburgh, Penn., and Birmingham, Ala., announces that S. M. Rust, who is retiring as president of the company, has been elected chairman of the board of directors, and S. M. Rust, Jr., who has been serving as executive vice-president, has been elected president.

**Wickwire Spencer Steel Co.**, New York, N. Y., has announced that the general sales offices of the springs and formed wire division and of the automotive division will be located at New Bond St., Worcester, Mass. A district sales office of these divisions will continue to be maintained at 500 Fifth Ave., New York 18, N. Y.

**Lima Locomotive Works, Inc.**, Lima, Ohio, has appointed Paul R. Ehrgott as general sales manager of the shovel and crane division, in cnarge of domestic and export sales.

**Link-Belt Speeder Corp.**, Chicago, Ill., has named Harold F. Allen chief engineer for the company. He will divide his time between the Chicago and Cedar Rapids plants. Mr. Allen has been with the company since 1916.

**Caterpillar Tractor Co.**, Peoria, Ill., announces the return of Lyle E. Hill as head of the railroad power division of the engine sales department. For two years, Mr. Hill has served the company as a priorities supervisor and special traveling representative of the purchasing department.

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., has named A. J. Schmitz as Pacific regional manager. Previous to his appointment, Mr. Schmitz was manager of the Seattle office.


**PULVERIZERS** for the reduction of Cement Materials, Limestone, **Agricultural Limestone,** Fire Clay and All Dry, Refractory Materials.

**Capacities: 1 to 60 tons per hour** **Finenesses: 20 to 350 mesh**

**BRADLEY PULVERIZER CO.**

*ALLENTOWN, PENNA.*

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

***Use the* BRADLEY AIR SEPARATOR**

**ERIE PORTABLE AggreMeters**

**36-YARD**
**52-YARD**
**68-YARD**

Plan now for post-war. Get the complete story on these 3 Erie standard portable storage and weighing AggreMeters

**ERIE STEEL CONSTRUCTION CO · ERIE, PA.**

*AggreMeters · Buckets · Concrete Plants · Traveling Cranes*

**PERFORATED METAL SAND AND GRAVEL SCREENS**

***Manufactured exactly to your specifications***

**Any size or style screen, in thickness of steel wanted with any size perforation desired.**

**We can promptly duplicate your present screens at lowest prices**

**CHICAGO PERFORATING CO.**
**2437 West 24th Place**
**CHICAGO, ILLINOIS**
**Canal 1459**

**UNIVERSAL SCREENS and "UNIVIBE" RIDDLES**

Efficiency, economy, greater capacity . . . these facts demand your interest in the Improved Universal Vibrators. Since 1919, the BEST in screening equipment at the LOWEST COST.

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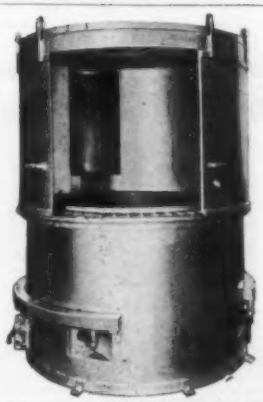
You should have a copy of the new 32-page catalog on Screens and Screening. Just ask for Catalog No. 107.

**UNIVERSAL VIBRATING SCREEN CO.**
RACINE - - WISCONSIN



*Oil or Gas Fired Capacities 300 to 5,800 lbs. zinc.*

***Fisher* FURNACES**

***for re-zincing gyratory crusher concave***

Fisher Iron Pot Furnaces provide a safe, convenient and economical method of melting and handling metal for re-zincing crusher concaves. Cast iron pot may be hoisted from furnace for pouring into transfer ladle or lowered into crusher for direct pouring. Write for Bulletin No. 550 showing Iron Pot Furnace and other furnaces for brass, bronze, aluminum, magnesium, tin, lead, zinc and precious metals.

**5553 NORTH WOLCOTT AVENUE, CHICAGO 40, ILLINOIS**

***Fisher* FURNACE COMPANY**

*Engineers and Manufacturers*

**Nordberg Mfg. Co.**, Milwaukee, Wis. announces the appointment of Oscar C. Gruender as consulting engineer of its crusher and screen division, with headquarters in the Wisconsin Tower Building, Milwaukee. Mr. Gruender has been with the company since 1908. D. A. Cheyette, sales manager of the crusher and screen division, has been appointed general manager of the division.

**Gar Wood Industries, Inc.**, Detroit, Mich., has appointed Roy Schoonfield acting manager of the Washington branch, succeeding A. E. Heath, who has been assigned to other duties with the corporation.

**Wickwire Spencer Metallurgical Corp.**, Newark, N. J., a recently formed subsidiary of Wickwire Spencer Steel Co., announces the appointment of Jack W. Forbes as sales manager in charge of all sales activities.

**Universal Engineering Corp.**, Cedar Rapids, Iowa, has appointed D. H. Young as director of exports, with headquarters at 120 Broadway, New York 5, N. Y. Mr. Young will appoint dealers in countries throughout the world with the exception of Russia, Canada, Mexico, Hawaii and the Philippines, where existing distributors will continue to serve the corporation.

**Wickwire Spencer Steel Co.**, New York, N. Y., has announced that Harold F. Ray has become associated with the company in an executive accounting capacity, with headquarters at 500 Fifth Ave., New York, N. Y.

**Robins Conveyors, Inc.**, Passaic, N. J., announces the appointment of Harold E. Murken as controller and assistant secretary; T. Webster Matchett as secretary, and John T. Hoyt as treasurer.

**The Timken Roller Bearing Co.**, Canton, Ohio, has announced that the site of the new bearing and rock bit plant to be operated by the Canadian subsidiary of the company will be at St. Thomas, Ontario, Canada.

**Easton Car & Construction Co.**, Easton, Penn., has announced the election of Sperry L. Searles as president of H. B. Fuller Equipment Co., Cleveland, Ohio, distributor in the northern Ohio territory for Easton equipment.

**Barber-Greene Co.**, Aurora, Ill., has been awarded the Army-Navy Production Award for the fourth time for outstanding achievement in producing materials essential to the war effort.

**The Manhattan Rubber Mfg. Division** of Raybestos-Manhattan, Inc., Stratford, Conn., was recently awarded a prize on its employee-serviceman house organ "The Firing Line" by the Direct Mail Advertising Association.

**Hammond Bag & Paper Co.**, Wellsburg, W. Va., has announced the appointment of R. S. Bostwick as their representative in Georgia, Alabama, Florida, South Carolina, and a portion of North Carolina. Mr. Bostwick's headquarters will be at 3026 Selwyn St., Charlotte 3, N. C.

**Wickwire Spencer Metallurgical Corp.**, subsidiary of the Wickwire Spencer Steel Co., New York, N. Y., has appointed Evelyn S. Carlson as sales and production coordinator at the company's Newark, N. J., plant.

**The Austin Co.**, Cleveland, Ohio, has announced the appointment of Laurence E. Cooney as vice-president and general sales manager. Mr. Cooney has been associated with the company for more than 25 years.

**The National Supply Co.**, Superior Engine Division, Springfield, Ohio, announces the re-opening of its St. Louis office at 1405 Boatmen's Bank Bldg., and the appointment of E. F. Haberkern as district manager.

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., announces the election of Walter A. Meyer, manager of dealer sales, to the position of president of the Multiple V-Belt Drive Association. Mr. Meyer was vice-president and chairman of the executive committee before his election as president.

**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., has appointed James McClure public relations representative for the Pacific region, with headquarters in San Francisco, Calif.

**H. K. Porter Co., Inc.**, Pittsburgh, Penn., has opened offices at 849 Petroleum Bldg., Los Angeles 15, Calif., with Harold A. Hintz as district manager. William W. Greenway has been appointed production engineer for Mt. Vernon Car Mfg. Co. and J. P. Devine Mfg. Co.

**Wickwire Spencer Steel Co.**, New York, N. Y., announces that the general sales office of the mechanical specialties division will be located at Clinton, Mass. A district sales office of this division will continue to be maintained at the New York address.

The Harrington & King Perforating Co.

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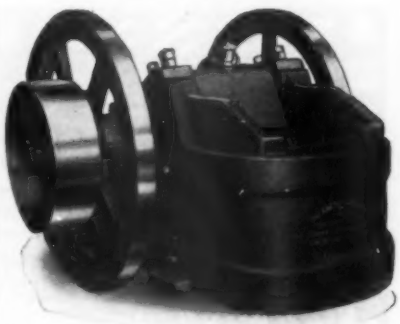
114 Liberty St., New York 6, N. Y.

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service



EARLE C. BACON, Inc.

17 John St., New York, N. Y.

WILFLEY centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog.*

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NEW YORK OFFICE: 1775 BROADWAY

DENVER-DILLON VIBRATING SCREENS

This screen embodies a basically different principle in the application of circle throw motion, the entire weight of the load and the screen is carried on 4-Spring-cushioned Rubber Insulated Suspension Rods and thus no weight is carried by the bearings. Maintenance and power costs are low.

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DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado

# Classified Advertisements

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I have purchased the large lot of splendid drifter drills, jack-hammers, jack-bits, etc., at Appalachia Dam, Tenn., TVA bought most of this equipment in 1942 and 1943 and has kept it in excellent condition. Will offer this virtually new equipment at approximately half price, and will ship subject to your approval upon arrival and before payment.

60 IR drifter drills, DA-35 & IR 35, centralisers and automatic power feed.

13 GD paving breakers, 272-H.

2 Sullivan paving breakers, K-7.

23 IR Jack-hammer drills, Model S-68.

2 GD Jack-hammer drills, Model S-55.

2 IR Wagon drills, Model X-71; tubular steel mounting; pneumatic tires.

37,000 IR detachable jack-bits, Type 2, 4 point; side hole; sizes 1 & ⅜ to 2 & ½". Detailed list on request.

ALSO

400 tons structural steel at Douglas dam, nearby. This includes 18" and 36" std. I-beams and 14" to 21" H columns, 4x6" and 6x8" angles; all long lengths.

800 gallons "Bitu-Preservo" black enamel steel preserving paint in 55-gal. steel drums with "E-Z seal" tops. Made by Pittsburgh Plate Glass Co.

300 lbs. Rock cork asphalt; Johns-Mannville Co.

2 Page dragline buckets; ¾ yd. & 2 yd.

23" dia. lifting magnet; 230 volts A.C.

54"x22" single roll Ocala knob roll crusher; 4 extra rolls.

4 Brooks 2 yd. Loadluggers, Model CH 200, with 90 buckets; 4—1½ yd. with 160 buckets.

Clutch pulley, 6 ft. dia. x 29" face.

**SAM SMITH, Machinery**
**P. O. Box 289 Phone 248 Marianna, Fla.**

### FOR SALE

1 Only—4 Mold Berg Brick Press. Excellent Condition; Attractive Price.

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### GOOD VALUES—ALWAYS

24x18" and 36x18" American Hammermills.
35 Ton Plymouth WLG Gaso. Locomotive.
80 HP to 550 HP Diesel Engines.
20 Ton American Steel Guy Derrick.
35 HP Clyde 2 drum swinger Gas Hoist.
1 Yd. P&H 600A gas crane and dragline.
80, 150, 250 HP Steam Boilers.

**MISSISSIPPI VALLEY EQUIPMENT CO.**
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### FOR SALE

2' Symons Cone Crusher; overhauled July, 1944. Optional, texrope drive and 50 h.p. motor.

**WAUKESHA LIME AND STONE CO.**
**Waukesha, Wisconsin**

Complete belt conveyors with motors. 30" conveyor 650 ft. centers; 30" conveyor 240 ft. centers; 30" conveyor 850 ft. centers; 24" conveyor 160 ft. centers. 1—350-HP A-C motor, 505 RPM, 440 volt, 3 phase, 60 cycle.

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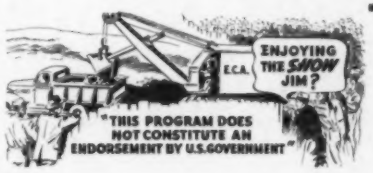


**True—the government does not endorse any product. But we are justly proud of the fact that we have furnished a great deal of equipment for important government jobs.**

### ELECTRIC CRANE

**1—18 ton O. & S. Type B CRANE, mtd. on 8' 0" ga. track, 50' boom. Power 52 H.P. 440/60/3 elect. mtr.**

#### AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

#### CRANES AND SHOVELS

1—1¼ yd. Erie gas air Model GA2, Serial No. 9758, with 45' boom and shovel attachment.

1—1 yd. Marion, Indl. 440, Serial No. 5061, 50' boom.

1—1 yd. Mdl. 600 P. & H., Serial No. 3502, 40' boom and backhoe attachment.

1—¾ yd. Conco crane, Serial No. 1304, fully revolving, power 70 HP. Continental gas engine, 30' boom.

1—¾ yd. P. & H. Model 400 crawler crane, Serial No. 4136, with 40' boom, gasoline powered.

1—½ yd. P. & H. shovel, Model No. 204, Serial No. 2303, gasoline powered.

1—¾ yd. Erie Model B2 crawler crane, steam powered, Serial No. 4027, with 50' boom and shovel attachment.

#### CONVEYORS

1—100' stationary troughing type belt conveyor, 16" wide.

1—30' Link-Belt troughing type portable, 18" wide.

1—25' Northern troughing type portable, 18" wide. With elect. or gas power.

#### CRUSHERS

1—9x12" Rogers jaw crusher (Like New).
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1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—9x12" Rogers jaw crusher, No. 314. LIKE NEW.
1—10x12" Colorado Iron Works roll crusher. Laboratory type.
1—Allis-Chalmers, No. 5 gyratory crusher, Ser. No. 5831, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

#### DERRICKS

3—Steel Guy Derricks: 1—20-ton American, steel derrick, 110' mast, 100' boom; 1—5-ton Terry Guy Derrick, 70' mast, 60' boom; 1—5-ton Insley, 75' mast, 80' boom. Stiff leg derricks: 1—35-ton Hunter, 40' mast, 50' boom; 1—2-ton Pittsburgh, 20' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton cap.

#### HOISTS (Elec., Gas, Steam)

85—Electric, ranging from 20 HP. up to 125 HP., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

Gas hoists ranging from 8 to 120 HP., single, double and triple-drums; all standard makes (38 in stock).

Steam, ranging from 8 HP. to 60 HP., single, double and triple-drum; all standard makes.

#### LOCOMOTIVE CRANES

3—25-ton Loco. Cranes, Browning and Industrial, Ser. Nos. 1724, 1720 and 2811, oil fired, 40', 45' booms.

1—25-ton Ohio steam Loco. Crane, Ser. No. 3722, 50' boom.

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**EQUIPMENT CORPORATION of AMERICA**

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Approximately 6,000 12x16 steel cored pallets

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### FOR SALE

90 H. P. 3 phase 220V 720R PM Wagner Electric motor. Rebuilt, guaranteed. 2 sand settling tanks; 4" discharge centrifugal pump; 4" pipe; 40" x 20'-0 rotary screen. Price right.

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**Crawfordsville, Indiana**

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Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your Inquiries.

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Guaranteed used Steel Pipe and Boiler Tubes
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BARBER-GREENE, portable, dual drum sand dryer on pneumatics with elevator and feeder. Excellent condition—used very little.

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7½ Symons Gyratory Crusher. Can see it in operation.

**ROCKLEDGE PRODUCTS CO.**
**Portland, Indiana**

**ECONOMY BRINGS YOU**

# *Wider selection...therefore* BETTER BUYS

Special offerings attractively priced in desirable shovels, cranes, and draglines. It will pay you to go over these listings carefully. Power—Gas—Diesel —Steam or Electric.

1—⅜ yd. Bay City Shovel Crane Combination. Michigan. $2390.00.

1—½ yd. Bucyrus-Erie 10B shovel dragline combination. Rebuilt. Guaranteed. Pennsylvania. $6050.00.

1—½ yd. Bay City "Pup" Shovel. New England. $2650.00.

1—⅝ yd. Byers, 35' crane boom, skimmer bucket, gas. Texas. $2800.00.

1—½ yd. Bay City backhoe, shovel. New York. $3190.00.

1—½ yd. Fundum Shovel. Rebuilt. Pennsylvania. $2650.00.

1—⅝ yd. Wilford Shovel and Crane Combination. Brand new. Owen ⅝ yd. clamshell bucket. California. $3600.00.

1—½ yd. Bay City "Pup" ¾ swing—backhoe and shovel. Pennsylvania. $3450.00.

1—½ Bay City Model 20, 6-cylinder Hercules. Good condition. Massachusetts. $5300.00.

1—½ yd. Bay City Model K shovel and crane. Rhode Island. $3700.000.

**1—1942 diesel Linkbelt Speeder ¾ yd. dragline with 1 yd. dragline bucket.**

1—Byers ⅝ yd. ¾ swing—25' crane boom, backhoe, skimmer scoop. Massachusetts. $2150.00.

1—⅝ yd. Byers Model BB backhoe and shovel—excellent condition. Streamlined cab. $6800.00.

1—⅝ yd. Byers Bearcat backhoe, skimmer bucket. New England. $1550.00.

1—½ yd. Bucyrus 10/20 shovel, crane combination. Rebuilt. Guaranteed. New England. $7100.00.

1—⅝ yd. General shovel. Colorado. $3550.00.

1—½ yd. General Shovel Crane. Up-State New York. $4100.00.

1—½ yd. Diesel General Crane, 35' boom. Pennsylvania. $7300.00.

1—½ yd. General shovel and dragline combination, 35' boom, ½ yd. drag bucket, Buda gas. Indiana. $4900.00.

1—½ yd Hanson shovel and crane combination. New York. $3900.00.

1—½ yd. Insley full swing Model "R", 30' boom, Buda gas. Excellent condition. Wisconsin. $4100.00.

1—½ yd. Insley backhoe shovel, Buda gas. Pennsylvania. $3200.00.

1—½ yd. Insley Excavator, 28' boom, bucket, 4-cylinder Buda. Arkansas. $3100.00.

1—½ yd. Koehring Shovel. Wisconsin. $4200.

1—½ yd. Speeder B1 dragline, 30' boom, fairleads, ½ yd. dragline bucket, Hercules gas engine. Illinois. $5100.00.

1—½ yd. Speeder Shovel. Michigan. $4900.00.

1—½ yd. Linkbelt Speeder Shovel, good condition. Kansas. $4300.00.

1—⅝ yd. B3 Speeder Shovel. North Dakota. $5300.00.

**SPECIAL**

**Late Model P&H 150, ½ yd. dragline and shovel combination, rebuilt and guaranteed, serial No. 5110.**

1—½ yd. Thew Lorain. New England. $3150.00.

1—½ yd. Northwest Model 2 shovel dragline combination. New York. $6400.00.

1—Northwest Model 18 shovel, backhoe, crane, 35' boom, trailer. Price on request. New York.

1—Ohio ½ yd. shovel crane combination. Rebuilt. Guaranteed. Texas. $8900.00

1—⅝ yd. P&H Model 200 Shovel. New Jersey. $2550.00.

1—⅝ yd. P&H 300A dragline. Louisiana. Price on request.

1—½ yd. Universal, 36' crane boom. Kentucky. $4200.00.

1—½ yd. Unit backhoe and crane combination. Ferdson gas engine. Wisconsin. $4900.00.

1—¾ yd. 1939 Bucyrus-Erie 20B shovel and backhoe combination. Rebuilt. New York City. Price on request.

1—¾ yd. Bucyrus-Erie Model 20B diesel, older model, still in good condition. Alabama.. $5200.

1—¾ yd. Byers "Bulldog" Type backhoe and shovel combination—New England. $5400.00.

1—1940 Lorain Model 40—¾ yd. backhoe, crane and shovel combination, dragline attachments, ¾ yd. Page dragline bucket, Owen clamshell bucket. Rebuilt. Guaranteed. New England. $12,650.00.

1—1939 ¾ yd. Marion backhoe, gas powered, Model 331. Rebuilt. Guaranteed. Up-State New York. Price on request.

1—¾ yd. Lorain Model L-45 shovel dragline combination. Alabama. $6700.00.

1—¾ yd. Marion shovel and crane combination. Rebuilt. Guaranteed, 1939. New England. $11,900.00.

1—¾ yd. Marion dragline. Rebuilt. Hercules 4-cylinder diesel engine. Arizona. $4950.00.

1—¾ yd. Marion, 1940, shovel backhoe, crane-dragline, Model 331. Rebuilt. Price on request.

1—¾ yd. Koehring Model 301 crane and shovel combination, boom 45'. Up-State New York. Price on request.

1—¾ yd. Bucyrus-Erie 20B electric tunnel shovel. New York City. $5150.00.

1—¾ yd. Koehring crane, 75' crane boom. Pennsylvania. $4900.00.

1—¾ yd. P&H 204 dragline crane combination, 4-cylinder Waukesha motor model ER, 35' boom, fairlead attachments. Oklahoma. $4900.00.

**REAL BUYS**

**1—Rebuilt and guaranteed Northwest Model 2⅜ yd. shovel and dragline combination. $5900.00.**

**1—Insley ½ yd. Model R 30' crane boom—excellent condition—½ yd. bucket. Wisconsin. $3900.00.**

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**1—Late 1939 Byers Model 83 shovel—excellent condition. New Jersey. $8250.00.**

1—¾ yd. Northwest Model 3 shovel. Connecticut. $6100.00.

1—¾ yd. Lorain 45 shovel crane combination, 40' boom. Rebuilt. Up-State New York. $8800.00.

1—¾ yd. Lorain 40 shovel, 4-cylinder Waukesha gas engine. Up-State New York. $8500.00.

1—¾ yd. Northwest Model 105, 4-cylinder Climax gas engine, boom 24'. Connecticut. $4850.00.

1—¾ yd. P&H 206, 40' dragline boom, 1 yd. Page automatic dragline bucket, 4-cylinder 85 H.P. gas engine. Indiana. $2900.00.

1—¾ yd. Byers Bearcat crane, ⅜ swing, 30' boom. Hercules 6-cylinder motor. Connecticut. $4100.00.

1—¾ yd. Osgood shovel crane combination, 40' boom. Michigan. $6600.00.

1—¾ yd. Speeder Linkbelt crane, gooseneck boom. New York. $3850.00.

1—¾ yd. P&H Model 400 Shovel. South Carolina. $4250.00.

1—¾ yd. Model "C" Koehring dragline, 40' boom. Florida. $4700.00.

1—¾ yd. Bay City T6B Excavator, backhoe, two skimmer buckets, ¾ swing. Pennsylvania. $2100.00.

1—¾ yd. Northwest Model 3 shovel. Utah. Price on request.

1—¾ yd. P&H 400, 30' crane boom, fairleads. Michigan. $4700.00.

1—¾ yd. Byers dragline, ¾ swing, 32' boom, 4-cylinder Buda engine. South Carolina. $2150.00.

1—⅞ yd. Bucyrus-Erie ⅔ yd. diesel crawler crane, 40' boom. Pennsylvania. $6400.00.

1—¾ yd. Byers Bearcat Shovel, Model OX, Hercules gas engine, 22' boom. ⅝ clam bucket. New Jersey. $1850.00.

1—¾ yd. Bucyrus-Erie 20B Shovel, 3-cylinder Atlas Diesel Engine. Alabama. Price on request.

1—¾ yd. P&H Model 206 crawler crane, 35' boom. Waukesha gas engine. North Carolina. $3350.00.

**1—1939 diesel/shovel and crane combination. Caterpillar D8800 diesel engine. Browning combination — 1 yd. shovel bucket, 50' crane boom, ¾ yd. backhoe and ¾ yd. clamshell bucket. Rebuilt and guaranteed.**

## 1 YARD

1—1 yd. Koehring, 35' crane boom, Model 301, Colorado. $4100.00.

1—1 yd. Koehring Model 301 shovel and crane combination, 45' boom. Up-State New York. $5900.00.

1—1 yd. Lorain 60A shovel. Rebuilt. Arkansas. $9400.00.

1—1 yd. Marion Model 340, 4-cylinder Buda gas engine. Good condition. Pennsylvania. $8900.00.

1—1 yd. Northwest Model 4 shovel and dragline combination, 60' boom, excellent condition. Rhode Island. $9200.00.

1—1 yd. Northwest shovel and crane combination Model 105, 4-cylinder Wisconsin engine, 40' clam boom. Oklahoma. $4950.00.

1—1 yd. Bay City Model "R", 40' boom, good condition. Louisiana. $6600.00.

1—1 yd. Electric Browning Crane, 56' boom. Ohio. $6600.00.

1—1 yd. Diesel Bucyrus-Erie Model D2, 40' dragline boom. Guaranteed. New York City. $8400.00.

1—1 yd. Bucyrus-Erie GA2 shovel. New Jersey. $4400.00.

1—1 yd. Byers Shovel and Crane combination, 40' boom. Pennsylvania. $6900.00.

1—1 yd. Keystone Excavator with backhoe. Maryland. $2900.00.

## 6—11 YARD

**6—11 yd. dragline, Bucyrus-Erie Monighan, Model 6150, 160' boom, 7 buckets.**

1—1 yd. Koehring 401 shovel and crane combination, 55' boom, clamshell bucket. New England. $7300.00.

1—1 yd. Linkbelt K-30, 65' boom, fairleads and clamshell. Rebuilt. Guaranteed. Price on request.

1—1 yd. Lorain 60A, rebuilt top to bottom, Shovel. Colorado. $8900.00.

1—1 yd. Marion Type 440 shovel, dragline combination. Texas. $4300.00.

1—1 yd. P&H 600, 50' boom. Rebuilt. Indiana. $3900.00.

1—1 yd. Northwest, 40' boom. Oklahoma. $6600.00.

1—1 yd. Northwest Model 104. Illinois. $3800.00.

**Northwest Model 5.**
**1—¼ yd. shovel entirely rebuilt. $8700.**

1—1 yd. Northwest Model 105, 55' boom. New Jersey. $4700.00.

1—1 yd. Northwest 105. Rebuilt. Florida. $4900.00.

1—1 yd. P&H 600, 40' boom, clamshell bucket, generator set and 48" magnet. Colorado. Price on request.

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Our Coast-to-Coast connections give us the inside track on much of the equipment available today. And this makes it possible for you to get just what you want at the minimum cost.

## 1¼ YARD

1—1¼ yd. Linkbelt Model K2, 45' boom. Waukesha gas engine. Up-State New York. $4200.00.
1—1¼ yd. Lorain 75B Crane, 75' boom, clamshell bucket. Connecticut. $10,450.00.
1—1¼ yd. Lorain 75A shovel, 4 cylinder Waukesha motor. Kentucky. $9750.00.
1—1¼ yd. Lorain 75 Crane, 50' boom. Waukesha gas engine 105 H.P. Oklahoma. $10,300.00.
1—Lorain 75B 1¼ yd. Shovel. 4 cylinder Waukesha gas engine, good condition. Texas. $12,900.00.
1—1¼ yd. Diesel Marion Model 450 Shovel, 4-cylinder Cummins Diesel Engine. Exceptionally good condition. Pennsylvania. $14,200.00.
1—1¼ yd. Diesel Marion Model 450, Buda Diesel Engine, dipper bucket. Oregon. $13,900.00.
1—1¼ yd. Marion gas electric shovel Model 450, 70' boom, 6-cylinder Buda motor. Oregon. $8300.00.
1—1¼ yd. Northwest No. 5 dragline, 50' boom and Page dragline bucket. Florida. $9800.00.
1—1¼ yd. Northwest Model 104 shovel and crane combination. New Jersey. $700.00.
1—1¼ yd. Northwest Model 104 shovel, crane and backhoe combination, 70' crane boom, backhoe attachment. Rebuilt. Illinois. $8750.00.

## LEASE OR SALE

**75-B Lorain 1½ yd. crane with shovel attachments, 70' boom, streamline cab, rebuilt condition.**

1—1¼ yd. Northwest shovel and crane combination, Model 104. New Jersey. $6700.00.
1—1¼ yd. Osgood shovel. Texas. $7100.00.
1—1¼ yd. Osgood shovel dragline combination. Good condition. Wisconsin. $8200.00.
1—1¼ yd. Osgood shovel. Missouri. $5800.00.
1—1¼ yd. P&H 700 shovel, Waukesha gas engine, 55' dragline boom. New Jersey. $8950.00.
1—1¼ yd. P&H Model 600A crane and dragline combination, 65' boom. Missouri. $6900.00.
1—1¼ yd. Diesel Shovel P&H Model 650, Atlas Imperial Diesel Engine. West Coast. $9700.00.
1—1¼ yd. Bucyrus-Erie Gas Air Shovel. Alabama. $3450.00.
1—1¼ yd. Byers Master Shovel. New York. $6300.00.
1—1¼ yd. Koehring Model 376. Rebuilt. Excellent condition. Alabama. $5800.00.
1—1¼ yd. Lima Shovel. New England. $8750.00.
1—1¼ yd. Lorain 75. Rebuilt. Guaranteed. New York. $10,400.00.
1—1¼ yd. Marion Model 450, 55' boom. Rebuilt. Up-State New York. $12,900.00.
1—1¼ yd. Orton, 70' boom. North Carolina. Price on request.

## 1½ YARD

1—1½ yd. Linkbelt Model K42 Crane, 60' boom. New Jersey. $7900.00.
1—1½ yd. Bucyrus-Erie 37B shovel and dragline combination. Good condition. Michigan. $17,900.00.
1—1½ yd. Diesel Koehring Model 502 Shovel, 6-cylinder Caterpillar Diesel Engine. Colorado. $14,500.00.
1—1½ yd. Osgood, Caterpillar 6 cylinder 75 H.P. Motor. Good condition. Texas. $7100.00.
1—1½ yd. P&H Model 650 dragline and crane. Rebuilt. South Dakota. $14,600.00.
1—1½ yd. Lorain 75B, 75' crane boom, dipper bucket and clamshell bucket. Rebuilt. Guaranteed. New York City. $11,900.00.
1—1½ yd. P&H Model 700 shovel and crane combination, 65' boom. Michigan. $6600.00.
1—1½ yd. Lorain 75, 1½ yd. dragline bucket. Rebuilt. Montana. $13,500.00.
1—1½ yd. Osgood. Texas. $7100.00.
1—1½ yd. P&H Model 700 B, 65' dragline boom. Ohio. $9300.00.
1—1½ yd. P&H Model 700 Shovel, 65' boom. Michigan. $6600.00.

## A FEW SPECIALS

**1—1½ yd. Lorain 75B—rebuilt condition with crane boom and shovel.**
**1—1½ yd. 1940 diesel Bucyrus-Erie 37B shovel.**
**1—1¾ yd. Northwest Model 7, 65' dragline boom—can be purchased reasonable—it is a real buy.**
**1—1¾ yd. Bucyrus-Erie 43-B diesel shovel and dragline combination.**
**1—1938 Lorain 30 shovel, backhoe and crane with bucket, rebuilt and guaranteed. $8200.00**
**1—⅜ to ½ yd. Bay City 1937 Model 20 backhoe and shovel.**

## 1¾ AND 2 YARDS

1—2 yd. Diesel Bucyrus-Erie 43B shovel, crane and dragline combination. 6-cylinder Waukesha gas and GMC Diesel Engines. Pennsylvania. Including $2500.00 new parts; price $18,900.00.
1—1¾ yd. Bucyrus-Erie 42B electric tunnel shovel. Virginia. $11,000.00.
1—2 yd. Bucyrus-Erie 50B Diesel Shovel. Rebuilt. Guaranteed. Ohio. $23,400.00.
1—2 yd. Marion electric shovel Model 37. Very good condition. West Coast. $18,400.00.
1—1¾ yd. P&H 705, 60' dragline boom. Condition good. Missouri. $17,250.00.
1—2 yd. dragline, 80' boom, Brownhoist make. Rebuilt. Excellent condition. New York. $18,900.00.
1—2 yd. Diesel Bucyrus-Erie 43B Shovel. Rebuilt. Guaranteed. Maryland. Price on request.
1—2 yd Diesel 50B Bucyrus-Erie Crane. West Coast. $16,500.00.
1—1¾ yd. Northwest Dragline, Model 7, 80' boom. Rebuilt. Guaranteed. Louisiana. $17,800.00.
1—1¾ yd. Northwest dragline, 65' boom. Rebuilt. New York. $18,500.00.
1—1¾ yd. Northwest Model 7 dragline—65' boom—good condition. Real bargain. Texas. $11,900.00.

## 3 YARDS TO 20 YARDS

1—3 yd Monighan Dragline, 76' boom, Westinghouse electric. Rebuilt. Illinois. Price on request.
1—3 yd. Diesel P&H Dragline, 110' boom. Rebuilt. Pennsylvania. $52,000.00.
1—3 yd Page Diesel dragline, 90' boom. Needs repairs. Illinois. $15,600.00.
1—3½ yd. Diesel Monighan 3W, converted from 3T, 80' boom. West Coast. $19,800.00.
1—3½ yd. Marion Model 490 electric shovel. Spare parts. Excellent condition. Price on request.
1—4 yd. Bucyrus 120B electric shovel. Minnesota. Price on request.
1—4 yd. Marion electric shovel. Rebuilt. Guaranteed. Price on request.
1—4 yd. Marion 125 electric shovel. Very good condition. Minnesota. $31,500.00.
1—4 yd. Bucyrus Monighan Diesel dragline, 70' boom. West Coast. Price on request.
1—6 yd. Marion electric dragline, 80' boom. West Coast. Price on request.

## STEAM SHOVELS—CRANES

6—¾ yd. Steam Shovels—Marion and Bucyrus-Erie.
3—1 yd. Steam Shovels—Marion, Bucyrus-Erie, Massillon, Osgood.
1—1¼ yd. Marion Model 480 Steam Shovel.
4—1½ yd. Marion, Bucyrus-Erie Steam Shovels.
1—2 yd. 50B Bucyrus-Erie Steam Shovels.
1—2 yd. Bucyrus 14 Steam Dragline.
1—3 yd. Bucyrus 80B Steam Shovel, 46' boom, 26' dipper stick.
1—4½ yd. Bucyrus-Erie Steam Shovel.
1—5 yd. Marion Steam Shovel.
1—8 yd. Marion Dragline, 165' boom.

## TRUCK CRANES

1—Michigan ½ yd. 10-wheeler Shovel and Crane. Rebuilt. New York. Price on request.
1—P&H 12-ton Model 300, 10-wheeler. New Jersey. $8500.00.
1—Lorain 40, 15-ton, 10-wheeler, 70' boom. New York. $11,400.00.
4—Universal and 3 P&H Truck Cranes. Write for details.
1—1939 Quikway on 6 wheeler truck, new tires 1000 x24.
1—18 ton Byers 10 wheeler truck crane—rebuilt and guaranteed.
1—Universal 10 wheeler—rebuilt condition. $5200.00.

## TRACTORS

2—RD8 Factory-rebuilt tractors, bulldozer, 13 yd. scrapers, winch, excellent condition.
1—RD7 Tractor with Garwood Hydraulic Bulldozer.
1—RD4 Tractor, brand new, LaPlant-Choate Bulldozer.
1—D7 tractor, front power unit, LeTourneau bulldozer, generating set—rebuilt and guaranteed. $5,700.00.
1—D-7 late model tractor with 6 yd. LeTourneau scraper, 6 large tires excellent condition. Price low.
A great many other Caterpillar, Allis-Chalmers and International Tractor listings on request.

## DUMP TRUCKS

12—Euclid 18 yd. Bottom Dump Trucks, built in 1941 or 1942. Ref. 201.
9—Euclid End Dump Trucks, built in 1941 or 1942. Capacity 12 cu. yd. Ref. 202.
3—20 cu. yd. Six-Wheel Maxi Model Two-Way Side Dump Trucks. Ref. 203.
15—Federal Trucks, built 1942, 17 ton carrying capacity. Ref. 204.

## SPECIAL

**3—1940 diesel Euclid dump trucks of 10 yds. capacity, powered by a Cummins Model H diesel engine at a bargain price. Wire for details.**

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**BELTED:** 355, 528, 676, 1000, 1200 & 1570 Ft.
**ELECTRIC:** 478, 676, 807, 1302, 1722 & 2200 Ft.
**DIESEL:** 603, 807 & 1000 Ft.
**PORTABLE GAS:** 110, 160, 220, 310, 540 & 1300 Ft.
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**CLAMSHELL BUCKETS, SKIPS & GRAPPLES**
Owen R. A. & H. Stone Grapples.
2 Yd. OWEN Type S Material Handling.
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
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⅝ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
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25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

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¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
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1 Yd. NORTHWEST Gas.
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1½ Yd. BUCYRUS 41B Steamer.
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46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
15—Std. Ga. 50 Ton Battleship Gondolas.

**FLAT CARS**
9—50 ton std. ga. heavy duty flat cars.

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Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 80, 100 & 150 HP.
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75, 90, 180, 200 HP. F. M. Engines.
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JEFFERY, 24x20 & No. 1 Sturtevant Ring Roll.
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10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

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8, 10 and 14 ft. Separators, Gayco & Bradley.

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36x60 Fairmount & 36x20 Diamond.

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10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 36x16, 9x36.

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5 No. 19, 25, 37 & 40 Kennedy.
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
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**IDLERS:** 54 In., 42 In., 36 In., 30 In., 24 In., 20 In., 18 In., 16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
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36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 20 Ft., 6 Ft. x 70 Ft., 10 x 20, 7½ x 100 & 8 x 110 Ft. Kilns.

**STEEL DERRICKS**
**GUY:** 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
**STIFF LEG:** 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

**LOCOMOTIVES**
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**STEAM:** 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
**ELECTRIC:** 2 Ton, 5 Ton, 8 Ton, 40 Ton.
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HUMMER ROTEX, NIAGARA & ROBINS.
**REVOLVING:** 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x22, 4x24, 5x30, 5x20, 6x20.

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1—Set of 18″x10″ Crushing Rolls.
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8—Belt Conveyors 20′ to 50′.
5—Tyler Screens 3′x5′, 4′x5′.
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*Partial List Only.*

**WANTED:** Crushers, Pulverizers, Dryers, etc. Send us your list.

**BRILL Equipment Co.**
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Victory K 3 Besser Tamper with Vibrator and attachments for making 3″, 4″, 6″, 8″, 12″ x 18″ blocks. 28 cubic foot Besser Mixer and Skip-Loader. 2,300 steel pallets 12¼ x 18¼. 54 Block Cars, 2 transfer cars, 1800′ track. 1—100 yd. 2 compartment Bin and Conveyor. Also belts, pulleys and motors required for the above.

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3′-0″ x 25′-0″ Dryer
3′-0″ x 30′-0″ Christie Dryer
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**REDUC. TYPE:** Kennedy Nos. 25, 37 & 40. Telsmith 3-F & 40. Traylor 36″ TZ, 8″, 10″, 12″ Super. McCully 6″x10″. Newhouse 5, 7, & 10″. Symons Cone & Disc Ty. 3′ to 4′.
**ROLLS:** Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16. Etc.
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**MILLS:** Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x9. Hardinge 6′x3′, 8′x30′ & 6′x9′. Misc. Tube Mills 5′ & 6′x22′. Sturtevant Ring Roll, Raymonds, Kents, Fuller Lehigh. Etc.
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Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kilns, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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Plymouth and Milwaukee gas locomotives, 8, 12, 25, 35 tons, 36″ and std. ga., A-1.
Davenport, Porter, Vulcan 18 to 20-ton steam, 36″ gauge S/T locomotives (4), rebuilt.
Vulcan 18-ton steam S/T locomotive, 42″ ga.
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Pioneer 300W portable gravel washing plant.
Gyratory crushers, 12″, 21″, 27″; 7″ Newhouse.
Page Diesel 2-yd. Walking dragline, 65′ boom.
Euclid 6-yd. bottom dump crawler wagons (8).
Monighan 3-yd. electric Walking dragline.
P&H ¾-yd. gas shovel, Model 204, 19′ boom.
Bucyrus-Erie 1¼-yd. gas-air shovel-cranes.
Bucyrus-Erie 4-yd. electric shovel, 129-B.
Bucyrus-Erie 30′ shovel boom, for 50B machine.
Boiler tubes, 236—1¾″x5′, ferrules, new.

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No. 5 Allis Chalmers gyratory crusher.
11″ x 18″ jaw crusher, top eccentric
30″ x 24″ Jeffrey hammer mill
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20″ x 6′ Pan feeder
Air Compressors, 100 to 1500 cu. ft.

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One 3-year-old Besser Super K3 Plain Pallet, fully automatic tamper, with double vibrator and air offbearer complete with motors and attachments to make 4″, 6″, 8″ and 12″ blocks 18″ long. Also 4″ and 8″ together. Capacity 320 operations per hour.
Two Besser 42 cu. ft. Mixers.
5,000 Steel Pallets. 12½″ x 18½″.
All equipment in excellent condition and priced for quick sale.

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Bucyrus Erie 42B Steam Shovel and Crane.
Buc. Erie 43B gas Dragline, rebuilt.
Buc. Erie 20B, 1 yd. Electric Tunnel Shovel.
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Cat. R.D.7 Tractor angledozer.
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Allis Chalmers H.D.14 with Baker bulldozer.
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Complete Ready Mix Concrete plants.
Transit Truck Mixers from 2 yds. to 5 yds.
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Flex-plane Finisher, 10'-15' up to 32'.

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Roll: 54x24, 54x20, 48x36, 30x24.
Telsmith 20-B steel frame Gyratory, V-belt drive.
Gyratory Crusher: K.V.S. 30, 37-S, 49; 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
Allis-Chalmers Anaconda Type, 54"x24".
Jaw: 6x12, 9x16, 10x20, 14x24, 12x36, 13x30, 16x32, 24x50.
Complete Rock Crushing, Sand and Gravel Plants.

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⅝ yd. Williams Clamshell, digging.
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Erie ¾ yd. Clamshell, rehandling.
Owen Stone Grapple.
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American 45-ton, steam, Saddle Tank.
Plymouth 36-ton, gas, std. gauge.
Vulcan 20-ton, steam, Saddle Tank.
Mack 30-ton, std. ga. Diesel-Electric.
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Whitcomb 14-ton Diesel, 36" gauge.
Vulcan 8-ton, std. gauge, gas.
Vulcan 6-ton, gas, 36" gauge.
Porter 12-ton, Saddle Tank, steam, 36" gauge.
3—Western Steel, 20 yd. Air Dump Cars.

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All Track Accessories

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**CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED**

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**ABRASIVE RESISTANT COVERS**

| Width | Ply | Top-Bottom | Covers |
|---|---|---|---|
| 48" | 8 | 1/8" | 1/16" |
| 42" | 5 | 1/8" | 1/16" |
| 36" | 6 | 1/8" | 1/16" |
| 30" | 6 | 1/8" | 1/16" |
| 30" | 5 | 1/8" | 1/16" |
| 24" | 5 | 1/8" | 1/32" |
| 24" | 4 | 1/8" | 1/32" |
| 20" | 5 | 1/8" | 1/32" |
| 20" | 4 | 1/8" | 1/32" |
| 18" | 4 | 1/8" | 1/32" |
| 16" | 4 | 1/8" | 1/32" |
| 14" | 4 | 1/16" | 1/32" |
| 12" | 4 | 1/16" | 1/32" |

*Inquire For Prices - Mention Size and Lengths*

## TRANSMISSION BELTING

**HEAVY-DUTY FRICTION SURFACE**

| Width | Ply | Width | Ply | Width | Ply |
|---|---|---|---|---|---|
| 18" | 6 | 10" | 6 | 6" | 5 |
| 16" | 6 | 10" | 5 | 5" | 5 |
| 14" | 6 | 8" | 6 | 4" | 5 |
| 12" | 6 | 8" | 5 | 4" | 4 |
| 12" | 5 | 6" | 6 | 3" | 4 |

*Inquire For Prices - Mention Size and Lengths*

## ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
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## FIRE HOSE

**APPROVED SPECIFICATION HOSE**
**EACH LENGTH WITH COUPLINGS ATTACHED**

| Size | Length | Per Length |
|---|---|---|
| 2½" | 50 feet | $28.00 |
| | 25 " | 16.00 |
| 2" | 50 " | 23.00 |
| | 25 " | 13.00 |
| 1½" | 50 " | 20.00 |
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**WATER HOSE**

| I.D. Size | Each Length with Couplings Attached Length | Per Length |
|---|---|---|
| ¾" | 25 feet | $4.25 |
| 1" | 50 " | 8.00 |
| | 25 " | 6.25 |
| 1¼" | 50 " | 12.00 |
| | 25 " | 7.50 |
| | 35 " | 10.50 |
| | 40 " | 12.00 |
| 1½" | 50 " | 15.00 |
| | 25 " | 10.00 |
| | 35 " | 14.00 |
| | 50 " | 20.00 |

**AIR HOSE**

| I.D. Size | Length | per Length | Couplings |
|---|---|---|---|
| ½" | 25 feet | $5.00 | $1.50 Pair |
| | 50 " | 10.00 | 1.50 " |
| ¾" | 25 " | 6.25 | 2.50 " |
| | 50 " | 12.50 | 2.50 " |
| 1" | 25 " | 10.00 | 3.50 " |
| | 50 " | 20.00 | 3.50 " |

**LARGER SIZES ALSO AVAILABLE**
*All Prices—Net—F.O.B. New York*

# CARLYLE RUBBER CO., INC.

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## READY FOR WORK— JUST OVERHAULED

P&H 600 Crawler Gas Combination Shovel, Crane and Dragline, one yard.
20-B Bucyrus Crawler Gas Crane and Dragline, ¾ yard.
Orton Crawler Gas Full Revolving Crane with half-yard bucket.
2 Barber-Greene Model 42 Crawler Gas Disc Type Bucket Loaders.
Monighan-Walker Type Diesel Dragline, 80' boom, 3-yard bucket.
All in first-class condition. Priced for quick sale.

**THE ACME EQUIPMENT COMPANY**
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### SHOVELS—DRAGLINES

2—120B Bucyrus Erie Elec. 80 Ft. Dragline Boom, 5 Yd. Bucket and 32 Ft. Shovel Boom 4¾ Yd. Bucket.
2—2½ Yd. 48B Bucyrus Erie Diesel Shovels and 60 Ft. Boom Draglines.
2—1½ Yd. Marion Diesel Shovels.

### 36 IN. CONVEYOR EQUIPMENT

800 Anti Frieton Troughing Idlers.
300 Anti Frieton Return Idlers.
1500 Ft. 6 Ply Conveyor Belt.

**R. C. STANHOPE, INC.**
60 East 42nd St. New York 17, N. Y.

### CRUSHERS, ROLLS, MILLS

Acme 6" x 21" type C jaw crusher, roller bearings
Buchanan 10" x 16" Blake type jaw crusher
New Eng. 11" x 20" jaw crusher, cast steel frame
Scholl 9" x 16" jaw crusher, heavy cast frame
Traylor "BULLDOG" 11" gyratory crusher
Sturtevant No. 0 Rotary Fine crusher
Buchanan 2 roll crusher, 30" x 14", C
Robins double roll 24" x 30" coal crusher
Single roll 24" x 24" spiked crusher
Simplex coal pulverizer with roller bearings
Williams No. 2 hammermill
Mid-West No. 2 hammermill
Eight tons of steel balls, 1" to 2"

### BUCKET ELEVATORS AND CHAIN

Chain elevators, 16", 18" and 20" buckets
Elevator casing, 16" x 58" of ¼" plate
Continuous 12" x 42' bucket elevator on belt
Continuous 14" x 42' chain bucket elevator
Continuous 14" x 50' chain bucket elevator
Continuous 30" x 40' double chain bucket elevator
Grain elevators, with 5" to 18" buckets on belt
Link Belt chain barrel elevator
500' of Pindle chain No. 730
500' of Jeffrey 126 DI-left and right chain
360' No. 3 Champion Oilwell chain
300' Jeffrey No. 1123 roller chain
400' of No. 78 chain with Salem buckets, 5" & 8"

### VIBRATING AND REVOLVING SCREENS

Robins "GYREX" double deck 4' x 10' screen
Simplicity three deck 3' x 6' vibrating screen
PLATO-O single deck 3' x 6' vibrating screen
Jigger three deck 2' x 5' vibrating screen
Hummer single deck 3' x 5' vibrating screen
Hummer single deck 4' x 5' vibrating screen
Generator for Hummer screens
Revolving screens: 4' x 16' and 4' x 22'

### CONVEYORS

Conveyor 23" x 96' with steel-belt
Jeffrey all steel foundry conveyor, 42" x 150'
Jeffrey 24" Standard Steel Apron Feeder, 35'
Link Belt single flight conveyor, 15" x 56'
Flat steel-plate conveyor, 47" x 25'
Hatss 14" x 24' Portable flat belt conveyor
Belt idlers and conveyor belt
Belt conveyor pulleys for 12" to 24" belt
Belt trippers for 14", 16", 18" and 24" belt
Weller 36" horizontal automatic take-ups
Screw conveyors 12" and 16" flights

### MISCELLANEOUS

Lidgerwood single drum 15 hp electric hoist
National double drum 25 hp electric hoist
Sauerman double drum 50 hp electric dragline
Chicago belted air compressor, 520CFM, N8B
Electric Motors from 1 to 100 hp
Morris 6F manganese lined sand pump
Ellicott 4" belted sand pump.
Worthington 4" centr. pump with 25 hp motor
Two 6" centr. 15 hp electric vertical pumps
4 ton and 8 ton 36" gauge gasoline locomotives
20" and 24" flat cars.
400 hp V-belt double pulley drive with V belts

### STONE WORKING EQUIPMENT

2 Meyers stone saws, 48" and 60" dia., late type
1 Lincoln open side electric planer, 42" x 12'
2 Lincoln open side electric planers, 36" x 12'
1 Patch 36" x 12' open side belted planer

**G. A. UNVERZAGT & SONS**
**136 Colt Street** **Irvington, N. J.**

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50x24 Champion Jaw Crusher
36x24 Farrel Jaw Crusher
36x18 Farrel Jaw Crusher
36x15 Universal overhead eccentric Jaw Crusher
18x9 Climax Jaw Crusher
16x8 Climax Jaw Crusher
24x12 Champion Jaw Crusher
No. 13A Telsmith Primary Gyratory Crusher
No. 38 Kennedy Reduction Crusher with 75 HP Synchronous Motor built in flywheel
3—Brand new Worm Washers, 14' long, 30" diameter
10'x5' Niagara single deck Vibrator
12'x4' Telsmith double deck Vibrator
12'x3' Symons double deck Vibrator
8'x3' Symons double deck Vibrator
25'x5'Traylor heavy duty Revolving
18'x4' Telsmith Ajax Revolving
Double drum Novo Hoist with 4 cylinder Novo gasoline engine directly connected on heavy cast iron base
Barnes Triplex high pressure pump directly connected to 4 cylinder Hercules Model 0 gasoline engine on steel wheels
Model 82 Barber Greene Bucket Loader on caterpilar with 4 cylinder Buda Engine with self-starter
1—1¾ yd. shovel bucket, manganese heavy duty
1—1¼ yd. Clamshell material handling Bucket

**FRANK A. KREMSER & SONS, INC.**
**R. D. No. 2, Reading, Pa.**
**Phone: Leesport 100**
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## KOEHRING DUMPTORS

**5 CU. YD., GAS DRIVEN**

| Serial No. | Rubber |
|---|---|
| D-418 | New Front and Rear |
| D-722 | Used front and Rear |
| D-723 | New Front, Used Rear |

Price for lot of three units, with one complete new clutch and one complete new transmission (less housing), $9,000.00.

Used rubber on jobs is fair to good. Units have been overhauled in our shops and we consider them in good serviceable condition.

**Inspection Invited**

**SERVTEX MATERIALS CO.**
**NEW BRAUNFELS** **TEXAS**

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10—20 yd., all steel, air dump, standard gauge.

### CRANE

1—Universal model 35, 28' boom, ⅜ yd. capacity, 45 H.P. gas motor.

### CRUSHER—JAW

1—Traylor 36 x 42 with or without Pan Feeder.

### CRUSHER—REDUCTION

1—Traylor 4 ft., type TY.

### DIESEL MOTORS

2—Cummins 200 H.P., supercharged Diesel Motors for use in Euclid and other similar heavy trucks.

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1—Lima 80 ton, 6 wheel, Switcher with piston valve, with tender, superheater, code boiler, 200 lbs. pressure, electric lights, Walschaert valve motion, automatic lubrication; thoroughly modern, excellent condition, immediate delivery. For sale or rent.
1—Baldwin and 1—American, 6 wheel, Switchers with tenders, 70 and 80 tons capacity, ASME code boilers.
1—Milwaukee 12 ton, gas, standard gauge.

### MINE HOIST

1—Allis Chalmers, single drum, 600 H.P., A.C., 2300 volts, drum 96" x 118" face, 2550 ft. 2⅛" rope, operating in balance, with all modern safety features.

### PUMPS

4—Two stage centrifugal, high speed, ball bearing, direct to 350 H.P., 2200 volt, 3 phase, 60 cycle, cap. 1070 GPM @ 1000 ft. with across-the-line starters.

### VIBRATOR SCREEN

1—Traylor FB-4 size 47" x 84" with generator.

### SHOVELS & DRAGLINE

1—Marion 4 yd. Electric, model 4160, full revolving, crawler tread, Ward Leonard control equipment, late type crawlers; perfect condition. Located in Minnesota.
1—Northwest model 80, 2 yd. capacity, gasoline.
1—Link Belt K-55, 2 yd. Dragline, diesel operated.

### TRUCKS

4—Euclid 18FD, end dump, 15 tons capacity, 200 H.P. Cummins supercharged diesel motors; guaranteed conditions.

### LOG TYPE STONE WASHERS

2—Eagle Log type Stone Washers 7' x 30' steel tub, 36" dia. paddles.

### WELL DRILL

1—Armstrong 29-T electric, crawler mounted, 220/440 volt, complete with cable tools, etc.

**Jaw Crushers, Gyratory Crushers, Roll Crushers, Dryers & Kilns, Hoists, Cars, Cranes, Shovels, Etc.**

**We Will Buy Any Modern Piece of Equipment Anywhere.**

**A. J. O'NEILL**
**Lansdowne Theatre Bldg.**
**LANSDOWNE, PA.**
**Phila. Phone: Madison 8300**

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## LOCOMOTIVES

1—20-ton Plymouth standard gauge gasoline.

1—20-ton Whitcomb diesel 36" gauge.

1—57-ton Baldwin type 0-6-0 standard gauge saddle tank.

2—67-ton American type 0-6-0 standard gauge separate tenders.

2—78-ton Baldwin type 0-6-0 standard gauge side tanks.

**B. M. WEISS COMPANY**
**Girard Trust Co. Bldg., Philadelphia 2, Pa.**

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## FOR SALE

Austin Gyratory Crusher No. 107.

Buchanan Crusher, 12" x 36" Type B Jaw Crusher.

Allis-Chalmers Double Roll Crusher, Garfield Type, Size 54" x 20", with new Manganese Roll Shells.

Lippman Scrubber Screen, 72" x 18', complete with G.E. 20 HP Motor, 440 volt, with starter.

Tyler Type 31 Tandem Hummer Screen, 8' x 5', 3 surface with G.E. Type G2 Motor Generator Set.

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We have the following new and used gasoline engines ready to go:

4 new large 125 h. p. valve-in-head Buda motors
3 new large 115 h. p. valve-in-head Continental motors
1 new 90 h. p. Streamline Continental
2 large 125 h. p. valve-in-head Budas, rebuilt and like new
1 104 h. p. Buda motor, rebuilt and like new
1 90 h. p. Continental, valve-in-head, rebuilt
3 rebuilt 90 h. p. Buda motors
7 rebuilt 80 h. p. Continentals
1 rebuilt 6-110 Waukesha
1 used 90 h. p. diesel, as is

All motors are fully equipped with self-starters, generators, large radiators, Twin-Disc clutches, etc. Write for prices and details.

**IOWA PORTABLE MILL COMPANY**
**Phone 111**
**George Lonien** **Oelwein, Iowa**
**Dept. "R"**

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1 Dual Mold Erickson Automatic Block Machine (made by Erickson Lift Truck Co.). Equipped for 8 x 8 x 16 and 12 x 8 x 16, capacity 3,840 blocks per 8 hour day. Also the following cored pallets:

10,000— 3 x 16 (Question)
11,500— 4 x 16 (Zenia)
2,300— 8 x 16 (Dapper)
3,700—12 x 16 (Hambell)
700—12" Double Corner
700—12" L Corner

All priced for quick sale.

**CROWN SIDEWALK & BLOCK CO.**
**2500 Washington St., N. E.**
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# FOR IMMEDIATE SHIPMENT

**SYMONS CONE CRUSHERS**

1—3′ with coarse bowl.
1—5½′ with coarse bowl.

**PRIMARY GYRATORY CRUSHERS**

2—Allis-Chalmers Superior McCully, 30″ and 42″ feed openings.

**CRUSHING ROLLS**

1—24″x40″ Pennsylvania, Single Roll.
2—18″x18″ Jeffrey, single roll.
2—40″x16″ double roll, smooth shells.

**RAYMOND PULVERIZERS**

2—4 roll High Side, complete, for extremely fine products.
1—4 roll High Side, equipped with whizzer separator and latest oil type journals.

**DIRECT HEAT ROTARY DRYERS**

1—4′x30′ Ruggles-Coles single shell. Can also be used as Rotary Kilns.
2—5′x40′.
1—5′x30′ Cummer, mounted on steel I-beam frame, with furnace, etc.
2—6′x30′ Ruggles-Coles, double shell.
1—6′x60′ Allis-Chalmers "Ebro" type, single shell.

**HARDINGE CONICAL BALL AND PEBBLE MILLS**

1—4′6x16″ Iron lined.
1—5′x22″ iron lined, silent chain drive.
1—6′x36″ silex lined, silent chain drive and motor.
2—8′x30″ silex lined, belt driven.

**STEEL GRINDING BALLS**

25 Tons, mixed, 2″ and 3″ Steel Balls.

**DORR CLASSIFIERS**

2—Dorr Combination Bowl & Rake Classifiers, 10′ dia. with 2′3″x19′8″ rake and 12′ dia. with 2′3″x21′4″ rake.

**BELT CONVEYORS**

1—30″x24′ long, heavy steel frame, semi-portable.
1—30″x120′ c/c Rex-Stearns anti-friction idlers; steel frame.
1—30″ approx. 500′ c/c with Jeffrey anti-friction idlers, gear reducer, motor, take-up etc.

**OLIVER CONTINUOUS FILTERS**

1—8′x8′ rebuilt, with new wood staves, wood grids and new internal piping.
2—8′x10′ with steel closed drums, wood staves, steel troughs, complete.

**HAMMER MILLS**

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1—No. 2024 Dixie Jr.
1—No. 36-40 Dixie Non-Clog type with 150 H.P., 3/60/2200 volt motor.
1—No. 5 Williams Roller Knife Shredder with 40″x30″ rotor.
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2—42″x36″ Type "B" Jeffrey, ball bearings.

FOR 25 YEARS A SYMBOL OF CONFIDENCE

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Shops and Yard at Newark, N. J., cover eight acres.

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1—42½ ton Porter 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, entire new firebox, rebuilt.

1—26 ton American 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, thoroughly overhauled.

1—72½ ton Baldwin 0-6-0 separate tender switcher, full time I.T.C. papers, overhauled.

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1—Whitcomb diesel locomotive, 36″ gauge, with Caterpillar V-8 engine, air brakes, electric lights. This locomotive built in 1936 and has now been put in first class serviceable condition with new wheels, chains, sprockets, reversing gear, and bronze clutch plates. Weight is 20 tons in full working order.

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5—Western 30 yard two way air operated side dump cars, standard gauge, **DROP DOOR TYPE**, first class condition.

**Birmingham Rail & Locomotive Co.**
BIRMINGHAM 1, ALABAMA

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**FOR SALE**

1—Gas Buda Motor with clutch. 125 H.P. at 1000 R.P.M. In good condition. Price $1100.00 f.o.b. loading point.

1—Harding Rod Mill, 4′ x 8′ with V-Belt Drive. In good working condition. Price $1500.00 f.o.b. loading point, without motor.

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One 40 ton American Locomotive, Standard gauge, air equipment, retubed in 1943.

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**A Good Time to Buy**

Bucyrus 120B, 4 yd. cat. electric shovel.
Koppel 20 yd. dump cars, steel side frame.
Armstrong No. 29 blast hole drill.
G. E. Motors, 1000 HP and 300 HP syn.
Hopper cars, 36″ ga. 25 ton center dump.
Hersey dryer, 6 ft. x 29 ft. single shell.
Diesel cat. crane (2) 30B; (1) 480 steam.
Steel guy derricks, 50 & 100 ton cap. 100′ B&M.
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Pulverizer air swept mill complete with fan, cyclone collector and piping. (Fuller Lehigh – Mill). No elevator or conveyor needed. Bargain for anyone wanting to do fine grinding.
4 Deck 4′ x 8′ Vibrating Screen
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1 Pair of track scales with automatic weight recorder. Ideal for Quarry Car weighing and recording.

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**Steel Tank on 50′ Tower.**
**Insley Guy Derrick, 85′ Mast, 75′ Boom.**
**2—100-ton Hydraulic Jacks.**
**4—NEW Gyroset Vibrating Screens. Screening surface 24″ x 48″.**

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**Symons Disc, Size 24.**
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**Gruendler Peerless Screenings Grinder, 24″ x 16″, No. 4.**
**12 x 24 Webb City Jaw Crusher.**
**16 x 16 Gruendler Lime Crusher.**

## CONVEYORS

**All types built to specifications.**

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## ½-YARD GAS SHOVEL

¾ swing, Type C, Insley, 17′ boom, 12′6 dipper stick. Also skimmer attachment. Rebuilt — very low price.

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70 H.P. Fairbanks-Morse, Diesel Engine, complete.

Jaw Crusher, 8 x 15, with 15 H.P. motor, 3—60—220.

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"CATERPILLAR" D4400, serial 4H478 power unit completely rebuilt, guaranteed ..... $1540.00

CONTINENTAL, 3—new, unused, Model F162 power units, 4-cylinder, 3-7/16x4⅜ displacement, 162.4 cu. in., each ..... $510.00

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WAUKESHA—Model WS16F, 5¾x8, 900 RPM, 80-90 H.P., with radiator, Twin Disc clutch, etc.; rebuilt ..... $920.00

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20 KW and 30 KW Int. & Cat. diesel Electric Sets.
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14 ton Whitcomb Loco-Gas-36 Ga.
20 ton Plymouth Loco-Gas-Std. Ga.
27-E Smith Paver, Model H-31.
5—Electric Hoists, 40, 50 and 60 HP.
1 yd. Round Shaft Buckets.
1 yd. and ½ yd. Dump Buckets.
2—Shovel Attach. Byers Bearcat Jr. Shovel Attachment for 41-B Bucyrus-Erie.

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4 Jeffrey-Traylor No. 4 Vibrating Pan Feeders, two never used, two only slightly.
36" Traylor TZ Gyratory Crusher, belt drive.
24"x36" Traylor Deep Frame Jaw Crusher.
No. 2 Williams Jumbo Jr. Pulverizer, rebuilt.
20"x24" Greenville Double Roll Crusher.
Universal 40"x20" Double Roll Crusher.
21"x42" McLanahan Single Roll Crusher.
Barber Greene Models 42 and 62 Bucket Loaders.
Austin-W Gravel Washing Plant.
¾ yard Orton Crane, 47' boom.
¾ yard Koehring Gas Shovel & Crane.
15—6 yard Sterling End dump trucks.
54" dia. x 40' Rotary Dryer.
165 Ton 3 comp. Blaw Knox Steel Bin.
12 x 36" Buchanan Type B Jaw Crusher.
17 x 36" Pioneer Roller Brg Jaw Crusher.
Raymond No. 00 Pulverizer, separator, collector.
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**WANTED TO BUY**
100 Ton Material Bin
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GONE TO WAR

**CORE DRILLING**
**ANYWHERE**
We look into the earth
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**SUPERVISOR-TECHNICIAN**
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14 Years' Experience.
Desires permanent position.
Highly recommended.
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College Graduate, Civil and Mechanical Engineer, CE and MED Degree. Fifteen years' experience as quarry Superintendent and Production Manager operating large quarry, Ready Mix Concrete plant and Building Material Warehouse.

Would like post-war position with permanent future. Available in thirty days, age 39, married and settled. Write Box C-1, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED—Young man with college education including training in chemistry and engineering desires position with progressive company. Have had 8 years' experience in development and production of all types of Portland and some special cements. Educational background and experience is such as to provide adequate qualifications for position as chief or research chemist or superintendent in the cement field. Write Box C-9, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED as Supt. of Crushing or Sand and Gravel Plant, 45 years of age, 25 years' experience in erection and operation of plants. Prefer permanent position in stationary plant, but will consider work out of States. Write Box C-5, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, ill.

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6 large deposits of soft and semi soft limestone, located on 3 different railroad systems in Ga. Approximately ⅓ million tons uncovered, other with good fullers earth as overburden. High calcium content and very good cementing value. Excellent stone for tile and brick, agricultural lime, road base material and for use in chemical trade. Mining simple and cheap. Supply of clay and lime sufficient for cement plant on 2 different locations. Will lease part or all.

**E. B. WEATHERLY — Owner**
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Permanent—Acid Free—Limeproof
Wide range of colors.
Also Marble and Granite Aggregates.
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for
**CEMENT-PLASTER-STUCCO**
**CONCRETE PRODUCTS**
*"FINE BECAUSE OF THEIR FINENESS"*
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**BLUE RIDGE TALC CO., INC.**
**HENRY, VIRGINIA**

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**WANTED**

Executive with experience in grinding, tabling, drying, acid treating silica sand. Must be able to design and construct entire layout. Eastern State location. State fully your qualifications and remuneration expected. Your reply will be treated confidentially. Write Box C-8, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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Experienced Superintendent wanted immediately for stone quarry in central west. About 600 yards per day, year around permanent job. Write Box C-10, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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Two Chemists with cement plant experience for routine analysis and research; one to direct work in plant control laboratory. Location South Carolina. Reply giving experience and draft status. Write Box C-4, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

**WANTED**

Plant Superintendent for Concrete Products Plant specializing in Architectural Concrete Slabs, Cast Stone, Pre-Cast Joists and Specialty Products. Must be versed in blue print reading, concrete mix designs, production schedules and capable of handling men. Will offer interest in business to right man, annual volume well over quarter million dollars. Please state age, previous experience and salary desired. Write Box B-97, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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Plant Engineer and Asst. Supt. for Cement Plant in West. Give age, positions held, family status, salary expected, etc. This is a permanent position with possibilities for promotion. Write Box B-91, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6.

CHEMICAL ENGINEER for research and development work on products for use in the cement industry. This position has excellent post-war outlook for the right man. Applicant should have several years' experience in the cement manufacturing field, especially grinding operations. Sales ability would be an asset. Must be able to furnish certificate of availability. Submit details on education, experience, personal history, salary record, draft status, and small non-returnable photo. All replies will be acknowledged. Write Box C-7, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

SUPERINTENDENT—Industrial sand plant. Write birth date, education, experience, salary expected. Write Box C-5, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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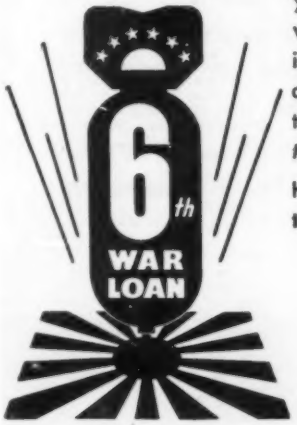
# *Keep Your Plant's Quota* "OUT FRONT!"

Victory depends upon materials—as well as men! To keep our American forces "closing in" overseas, you and every other manufacturer here at home must *keep on making* "Out Front" War Bond Quotas!

This means *action now* on *every* point in the fighting 8-Point Plan to step up Payroll Deductions. For instance, have you a 6th War Loan Bond Committee, representing labor, management and other important groups in your company? Selected Team Captains yet—preferably returned veterans? If so, have you instructed them in sales procedure—and given each the Treasury Booklet, *Getting the Order?*

How about War Bond quotas? Each department—and individual—should have one! Assigning responsibilities is vital, too! Have you appointed enough "self-starters" to arrange rallies, competitive progress boards and meeting schedules? Are personal pledge, order or authorization cards printed, and made out in the name of each worker? Planning for resolicitation near the end of the drive? Your State Payroll Chairman is ready now with a detailed Resolicitation Plan. And, have you contracted for space in *all* your regular advertising media to tell the War Bond story?

Your positive *Yes* to *all* points in this forward-to-victory 8-Point Plan assures your plant meeting an "Out Front" Quota in the 6th War Loan—and speeds the day of unconditional surrender!




*The Treasury Department acknowledges with appreciation the publication of this message by*

## ROCK PRODUCTS

*This is an official U. S. Treasury advertisement—prepared under the auspices of Treasury Department and War Advertising Council.*

**Make wire rope last . . .**

**keep it on the job**

Sharing your wire rope with the armed forces doesn't mean going without; it just means taking *care* of what you have. For example, inspect it often. Lubricate when indicated. Operate at capacity, but don't overload.

When you must replace a rope, get *Preformed* Yellow Strand for heavy-duty quarry jobs. It's strong, flexible, highly resistant to kinking and fatigue—qualities that result in long rope life. Specify *Preformed* Yellow Strand for hoist and drag lines on your dragline machine . . . for holding and closing lines on clam shells . . . for hoist and swing lines and as rack and crowd ropes on power shovels. B & B engineers will gladly help you *choose* the right rope and *use* it right.

**Broderick & Bascom Rope Co., St. Louis**

*Branches:* New York, Chicago, Houston, Portland, Seattle
*Factories:* St. Louis, Seattle, Peoria

**YELLOW STRAND**

***PREFORMED WIRE ROPE***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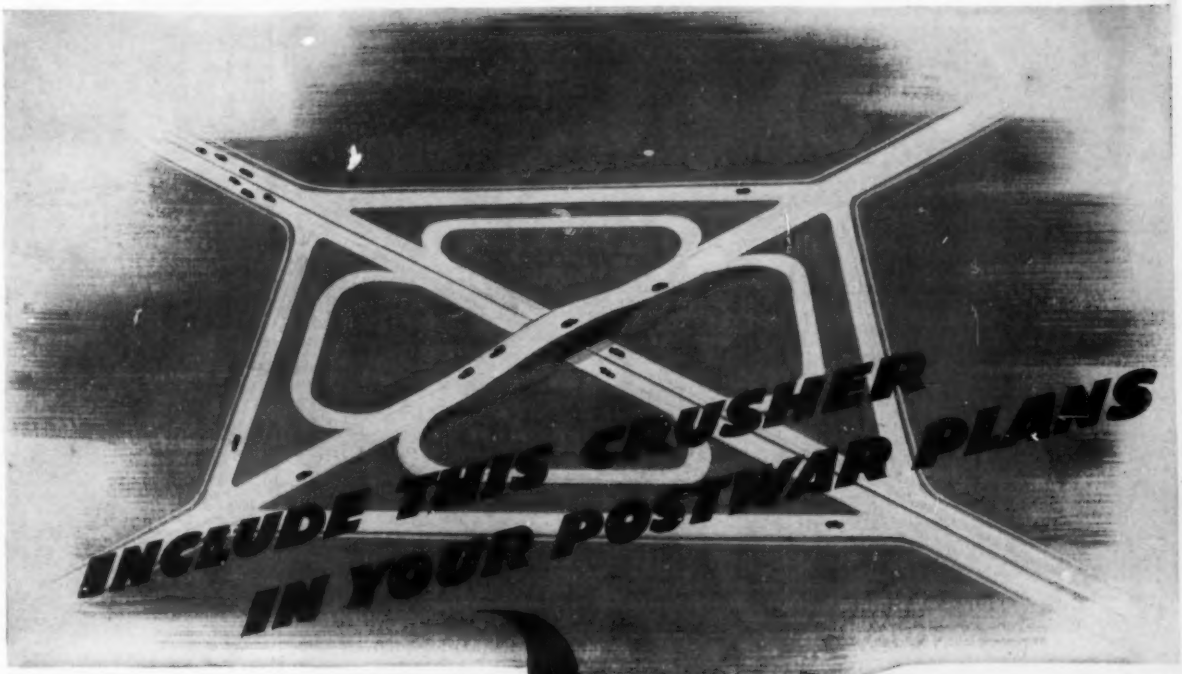
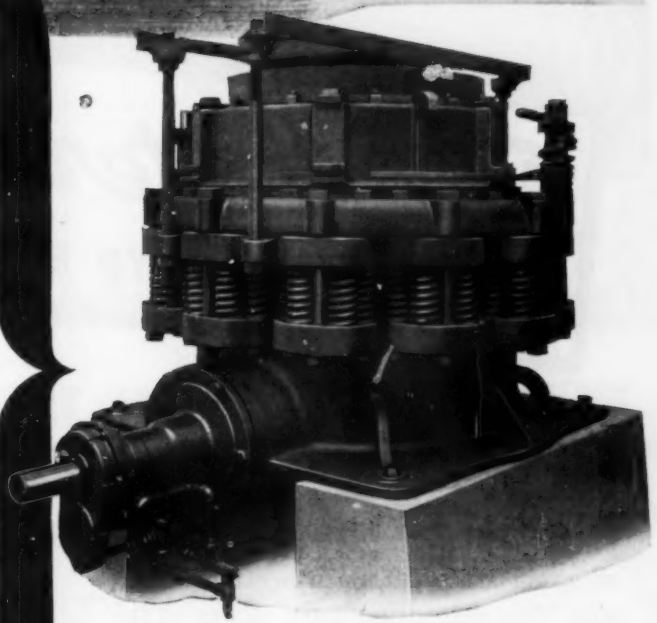



• Now is the time to make preparations for greater production of postwar materials that will be required for roads, air fields, dams and other postwar projects. With increased demand for big tonnage of more finely crushed products obtained at lower cost, consideration should be given now to the equipment that will be needed to produce such materials in the future. For fine crushing in quantity, no crusher can equal the performance of the Symons Cone. Many users of Standard Cones are following these with Short Head Cones in order to produce those finer sizes in quantity for which there is an ever increasing demand. If it's fine reduction crushing, it can best be done with a Symons Cone.



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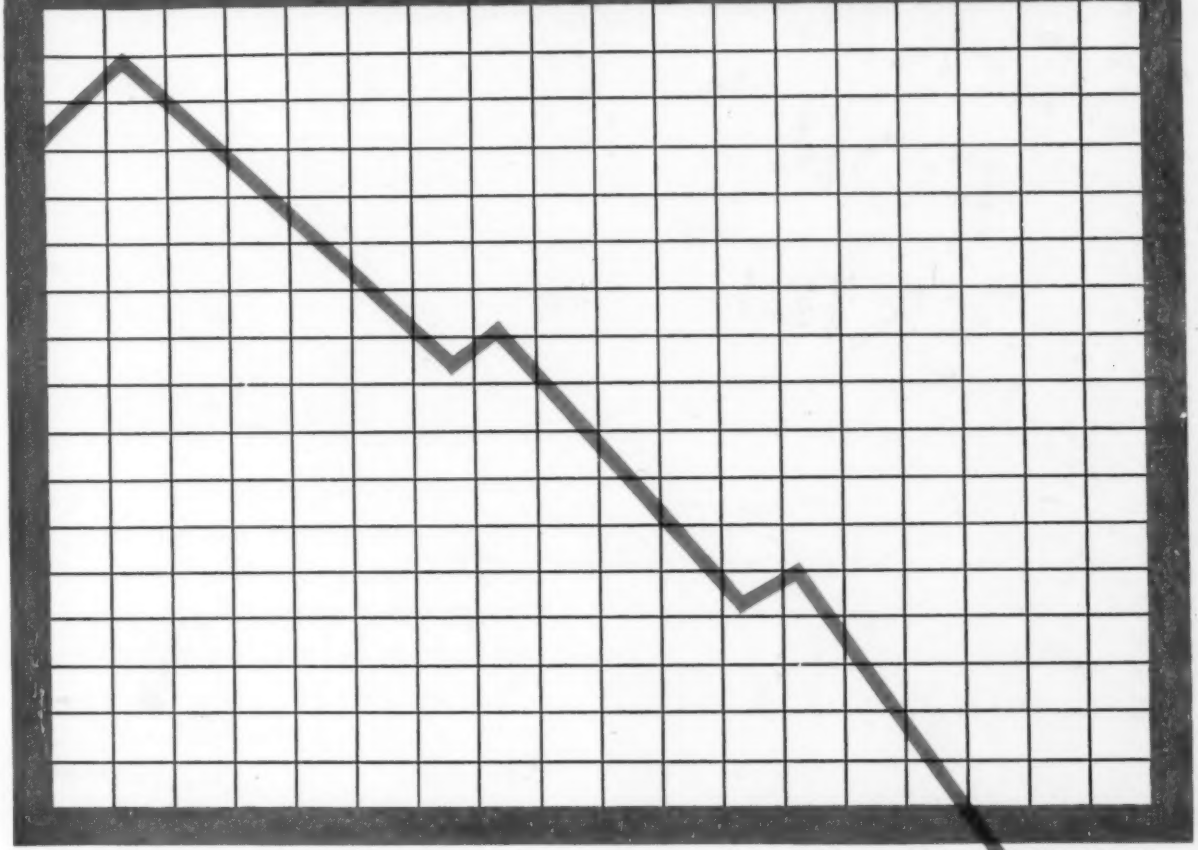

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**(Yes—it's safer to handle)**

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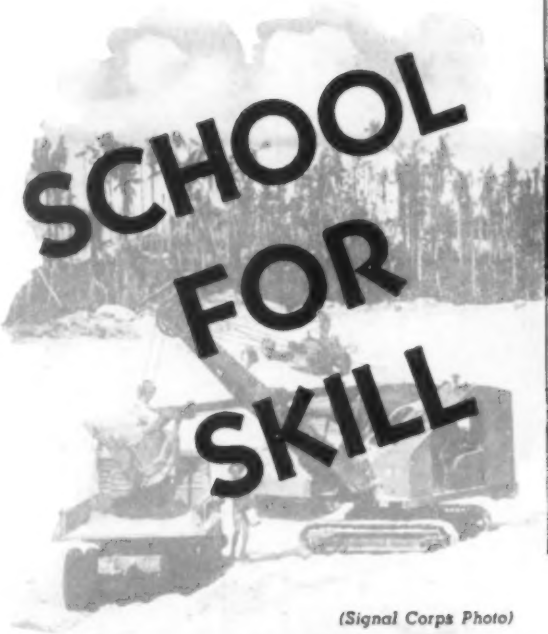

(Signal Corps Photo)

SOUTH PACIFIC—A [illegible]
(Official Navy Photo)

ADAK—A 15-B crane erects a hangar.
(Official Navy Photo)

The men who are doing such an effective job of using today's fine excavators as weapons against the Axis, will be ready to apply their war-developed skill to the operation of tomorrow's better machines. The combination will make excavating a vital factor in building a **better** peace-time world.

As in war, Bucyrus-Eries, operated by war-trained men, will produce outstanding results on your postwar work.

v-88c

**BUCYRUS ERIE**

**SOUTH MILWAUKEE, WISCONSIN**

ALGIERS—A 10-B dragline widens a drainage ditch.
(Signal Corps Photo)

ALEUTIANS—A 75-B crane unloads supplies.
(Official Navy Photo)